

TERPANDER

**The Invention of Music in the
Orientalizing Period**

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ABSTRACT

The legend that Terpander rejected “four-voiced song” (τετράγηρυν αοιδάν) in favor of new songs on the seven-stringed lyre (ἐπτάτονος φόρμιγξ) epitomizes the Greek exposure, at the height of Assyrian power (c. 750-650 B.C.), to the Mesopotamian tradition of classical music. Terpander’s ‘invention’ answers clearly to the heptatony which was widely practiced in the ancient Near East, as known from the diatonic tuning system documented in the cuneiform musical tablets. “Four-voiced song” describes the traditional melodic practice of the Greek epic singer, and must be understood in terms of its inheritance from the Indo-European poetic art. The syncretism of these two music-streams may be deduced from the evidence of the later Greek theorists and musicographers. Though diatonic scales were also known in Greece, even the late theorists remembered that pride of place had been given in the Classical period to other forms of heptatony—the chromatic and enharmonic genera, tone-structures which cannot be established solely through the resonant intervals of the diatonic method. Nevertheless, these tunings were consistently seen as modifications of the diatonic—which Aristoxenus believed to be the ‘oldest and most natural’ of the genera—and were required to conform to minimum conditions of diatony. Thus the Greek structures represent the overlay of native musical inflections on a borrowed diatonic substrate, and the creation of a distinctly Hellenized form of heptatonic music. More specific points of contact are found in the string nomenclatures, which in both traditions were arranged to emphasize a central string. There is extensive Greek evidence relating this ‘epicentric’ structure to musical function, with the middle string acting as a type of tonal center of constant pitch, while the other strings could change from tuning to tuning. So too in the Mesopotamian system the central string remained constant throughout the diatonic tuning cycle. Hence the melic revolution of the Archaic period represents the fruit of an Assyrianizing, diatonicizing musical movement.

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ABBREVIATIONS

CA	J. U. Powell, <i>Collectanea Alexandrina</i> (Oxford, 1925)
CAD	<i>The Assyrian dictionary of the Oriental Institute of the University of Chicago</i> (D. Gelb <i>et al.</i> , ed.)
CGF	G. Kaibel, <i>Comicorum Graecorum Fragmenta</i> (1899)
D-K	H. Diels and W. Kranz, <i>Fragmente der Vorsokratiker</i> , 6th edition (1952)
DMG	Ventris, M./Chadwick, J., <i>Documents in Mycenaean Greek</i> , second edition (Cambridge, 1973).
FGrH	F. Jacoby, <i>Fragmente der griechischen Historiker</i> (1923-)
FHG	C. Müller, <i>Fragmenta Historicorum Graecorum</i> (1841-70)
K-A	R. Kassel and C. Austin, <i>Poetae Comici Graeci</i> (1983-000)
LSJ	Liddell and Scott, <i>Greek-English Lexicon</i> , 9th edition, rev. H. Stuart Jones (1925-40).
MSG	Jan, C. von, <i>Musici scriptores Graeci: Aristoteles, Euclides, Nicomachus, Bacchius, Gaudentius, Alypius</i> (Leipzig, 1895).
MSL	Landsberger, B., <i>Materials for the Sumerian Lexicon</i> (Rome, 1937-)
PHib	<i>Hibeh Papyri</i> (1906-55)
PMG	D. L. Page, <i>Poetae Melici Graeci</i> (1962)
PMGF	Davies, M., <i>Poetarum Melicorum Graecorum Fragmenta. Vol. 1 Alcman Stesichorus Ibycus</i> (Oxford 1991).
POxy	<i>Oxyrhynchus Papyri</i> (1898-)
SEG	<i>Supplementum epigraphicum Graecum</i> , ed. varii (Amsterdam, 1923-)
SVF	J. von Arnim, <i>Stoicorum Veterum Fragmenta</i> (Leipzig, 1923-38)
TrGF	B. Snell, R. Kannicht, S. Radt (eds.), <i>Tragicorum Graecorum Fragmenta</i> , 4. vols (1971-85)
UET	<i>Ur Excavations. Texts</i> (London and Philadelphia, 1928-)

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I hope Professor Kilmer will not be offended that I consider her the fairy-godmother of Mesopotamian music; not only did she start the whole ball rolling with a brilliant series of textual breakthroughs, but she responded immediately to a timorous letter, in which I sought advice about *pitnu*, by inviting me to Berkeley, where we had a marvellous time and became fast friends. On that occasion we lunched with Professor Crocker, who planted the idea that the etymology of *τόνος* might be crucial; to him, more than anyone, I owe my musicological approach, for some brief comments on resonance led me to view Mesopotamian diatony as an idiosyncratic, and not universal, way of organizing musical tones. Soon afterwards, I imposed myself upon Professor West, who—much to my astonishment—found time to critique two very wordy and scattered drafts, larded with countless embarrassing errors; this led to other major shifts, particularly regarding *ἀρμονία*. But I owe a much greater debt to his own imaginative and adventurous work on Greek music, as will be obvious throughout Part One; more than anyone, in my opinion, he has brought the subject to the scholarly mainstream, where it now enjoys unprecedented attention. A chance barbecue encounter with Professor Jeremy Black led to very friendly relations and an introduction to Professor Gurney, whose work on the Retuning Text completed our knowledge of the Babylonian system; he too was very generous with time and support, working through a long intermediate draft and engaging in an enjoyable correspondence in which he offered helpful corrections and clarifications on points of Akkadian philology. Inevitably I differ from Professors Kilmer, Crocker, West, and Gurney—who do at times disagree amongst themselves—on certain points. I hope they will

forgive these departures, since on many other questions I hope to offer confirmation of their views.

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J. C. F.

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There is a historical perspective that, like every view of things which is subordinated to the laws of optical perspective, only renders distinct those objects on the nearest planes. As the planes recede from us, they elude our grasp and only let us catch glimpses of objects devoid of life and useful meaning. A thousand obstacles separate us from the ancestral riches which yield to us only aspects of their dead reality. And even then we grasp them by intuition rather than by conscious knowing . . . What then shall we say about ancient music, and how could we judge it with the instrument of our reasoning mind alone? For here instinct fails us. We lack an indispensable element of investigation: namely, the sensation of the music itself.

Stravinsky, Poetics of Music

TERPANDER

The Invention of Music in the Orientalizing Epoch

1.0 Introduction

- 1.1 A distant sympathy between Greek and Indian music theory had sometimes been suspected. Following the Western discovery of Sanskrit in the eighteenth century, classically-trained scholars undertook the exploration of ancient India. As they encountered the musical writers, the Greek theoretical treatises were a natural and useful point of reference. Both traditions were concerned in large part with heptatonic or seven-pitch scales. Both developed refined systems for understanding the relationships between them, and in both we find the awareness that seven such scales may be understood as transformations or ‘rotations’ of each other.¹ Furthermore, the technical vocabulary of each was founded upon the language of stringed instruments. Most suggestive of all is that in each tradition the fourth of seven pitches was identified as “middle” (Greek μέση; Sanskrit *madhyama*) and given a central, if poorly documented, role. Fox-Strangways (1914) took these parallels to be a mark of common Indo-European ancestry.²
- 1.2 According to another school of thought, it stood to reason that the Greeks might owe some musical debt to the ancient Near Eastern urban cultures. Farmer (1957), assembling the Greek sources which record Asiatic origins for many instruments, as well as tales of Pythagoras in Syria, Egypt, Phoenicia, and Babylonia, posited an ultimately Mesopotamian origin for the musical ratios, the Harmony of the Spheres,

¹ Datilla’s *Datillam* 15 (c. 700 A.D.) refers to the “circle of notes” (*svaramaṇḍala*). Other evidence for the circular conception in Indian theory is discussed by Widdess (1995), 48.

² Fox-Strangways (1914), 122: “Neither is there any suggestion that Greece borrowed from India or vice versa; their musical systems, like their languages, were no doubt part of their common Aryan inheritance—with enough likeness and unlikeness to make the comparison convincing”; cf. Jairazbhoy (1971), 16.

and “a theory of music which was actually the starting-point of our present system.”³ The organological debt to the Near East is in little doubt,⁴ though the Pythagorean material, from late sources with some programmatic bias, is more problematic than Farmer allowed. Nevertheless, the cumulative weight of the evidence demonstrates conclusively that Hellenic musical culture came in contact with a variety of Asiatic tone-systems at different stages of its history. At that time, however, as Henderson (1957) pointed out in her companion article, “for oriental influences in music of this date there can be no concrete evidence”.⁵

- 1.3 Winnington-Ingram (1936), while acceding to the prevalent opinion that “in all probability Greek music was closely related to that of the contemporary Orient”, insisted that “before we can profitably use our knowledge of this background, we must first know what precise features of Greek music we can set against it”.⁶ His masterful *Mode in Ancient Greek Music*, despite a number of excellent studies which have greatly facilitated work on the subject, has remained the forward limit of knowledge and opinion about the Classical Greek tone-system itself.⁷ According to the position established there, the Perfect System (σύστημα τέλειον)—documented in the late fourth century by Aristoxenus, Aristotle’s cantankerous colleague and in-house musicologist—was the Greeks’ first theoretical structure, the culmination of fifth-century efforts to find some common structural ground between various heterogeneous tuning conventions—the ἁρμονίαι.
- 1.4 This evolutionary view arose largely from the belief that the earliest tunings of which we hear were ‘defective’, not yet achieving the complete diatonic enumeration that underlies the Perfect System with its cyclical species (εἶδη or τόνοι) and pitch keys (τόνοι).⁸ Aristides Quintilianus for instance, a neo-Platonizing musicologist of

³ Farmer (1957), 250-4, here 253.

⁴ See for example Guillemin and Duchesne (1935); Duchesne-Guillemin (1969b); Gombosi (1944), 170; Lasserre (1988), 72; West (1992), 49ff.; West (1997), 31; contrast Anderson (1994), 6.

⁵ Henderson (1957), 390.

⁶ Winnington-Ingram (1936), vii.

⁷ But the valuable discussion of Henderson (1957), 344-58 should not be overlooked.

⁸ For the two senses of τόνοι, see Winnington-Ingram (1936), 82f; cf. 2.20-22, 7.10. Henderson (1957), 347 offered a valuable refinement to our interpretation of the τόνοι, seeing them not as absolute pitch-keys but “theoretical concepts employed to define and name the relative *loci* of the topography of harmonic space”.

perhaps the late third century A.D.,⁹ preserves a collection of ἀρμονίαι, allegedly those known to Plato himself, which show sometimes more, sometimes fewer than seven pitches.¹⁰ There is also the σπονδειαῖον τρόπος (“Libation Style”) studied by Aristoxenus, a melody of the Archaic period attributed to the great aulete Olympus which, unlike the contiguous scales of the Perfect System, had an intervallic or ‘gapped’ structure, as it is commonly described.¹¹ Finally, a handful of sources, beginning in the later fifth century with Philolaus—the earliest extant Pythagorean—have been read as attesting ‘defective’ scales, covering an octave in seven strings and so ‘omitting’ one pitch which was later filled in.¹² Thus, while admitting that it was “attractive” to equate the octave species of the Perfect System with the ancient ἀρμονίαι—for “it is clear that they were to some degree the heirs of the ἀρμονίαι, for both the term ἀρμονία and the modal names were applied to them”—Winnington-Ingram nevertheless thought it better to see them as “systematized surrogates of less uniform scales”.¹³

- 1.5 Nor did he find any clear evidence bearing on “the modal importance of various notes”.¹⁴ Only μέση was given any importance in the sources, and even so could not be clearly understood in terms of modal function, nor simply be equated with our own concept of ‘tonal center’. Students of ethnomusicology and music archaeology might refine Winnington-Ingram’s criteria, for the concept of mode has been rather broadened in recent years.¹⁵ Nevertheless, his working definition shows more acuity than do many subsequent scholars¹⁶—one detects the influence of Fox-Strangways,

⁹ For dating evidence, see Mathiesen (1999), 521-4.

¹⁰ Aristid. Quint. 1.9. On these scales generally see Winnington-Ingram (1936), 55ff.; West (1992), 174f. and n. 47 with literature cited there.

¹¹ Aristox. fr. 83 = ps.-Plut. *de Mus.* 1135a; see Winnington-Ingram (1928); Barker (1982-9), 1.255ff.

¹² Philol. fr. 44B6a D-K. This interpretation is disproved in 8.0.

¹³ Winnington-Ingram (1936), 10f.; cf. 69, 82; cf. Anderson (1994), 139f. For Akkadian *pitnu* as a precedent for ἀρμονία as “diatonic octave species”, see 6.7.

¹⁴ Winnington-Ingram (1936), 81.

¹⁵ See e.g. Widdess (1995).

¹⁶ “Mode is essentially a question of the internal relationships of notes within a scale, especially of the predominance of one of them over the others as a tonic, its predominance being established in any or all of a number of ways: e.g. frequent recurrence, its appearance in a prominent position as the first note or the last, the delaying of its expected occurrence by some kind of embellishment . . . Mode may be defined as the epitome of stylized song,

whose ideas about the inherent conflict between modality and harmony deserve wider attention¹⁷—and his negative results may indicate rather that the ancient ἀρμονία belonged to a musical practice not adequately described as ‘modal’. And so he concluded on a disappointed note:

I doubt if anyone has ever completed a book upon Greek music without feeling acute dissatisfaction both with his subject and with himself . . . Yet complete despondency is as unnecessary as it is ignoble. Every student of the subject must from time to time have the feeling that there is a certain amount of evidence, particularly concerning the earlier stages of Greek music, that is still unrelated together, and must hope that one day he will strike upon the true, the illuminating hypothesis which is to relate it.¹⁸

1.6 But twenty five years later, new hope came for “the earlier stages of Greek music” when Kilmer (1960) published the first of the cuneiform musical tablets.¹⁹ This grew in time to a small corpus of texts, in both Sumerian and Akkadian, on music and music theory. Widely scattered in time and space, these works come from Ur, Nippur, Ugarit, and Assur, and range in date from about the eighteenth century B.C. to the fourth or third, with clear Sumerian antecedents. The very fact that they make up only a minute fraction of the hundreds of thousands of tablets which have been discovered makes it all the more remarkable to find in them a consistent body of terms and concepts. As Kilmer observed, “one could almost say that it has been uncanny how each text, as it was discovered or recognized, has elucidated the other(s).”²⁰ The tablets reveal a theoretical and practical tradition of astonishing continuity, known across large reaches of the ancient Near East through a cultural network of court and city.²¹

1.7 Many details of this system remain obscure, but it is clear that the Mesopotamian cultures knew a system of interrelated heptatonic scales as highly refined as those

of song stylized in a particular district or people or occupation . . . The colour of each mode, each type of song, is precisely felt; and there is great reluctance to combine them by modulation” (2f).

17 Fox-Strangways (1914), 1-5.

18 Winington-Ingram (1936), viii, 83.

19 Kilmer (1960).

20 Kilmer (1971).

21 I discuss these tablets in detail in 6.0 For a good introduction to the subject, an overview of the central texts, and further bibliography, see Kilmer (1994).

attested so much later in Greece and India. Here too the essential concepts are presented in terms of stringed instruments. The so-called Retuning Text (UET 7/74) shows seven scales as permutations of each other in a cyclical scheme, and so seems to predict the later systems of the Greek and Indian theorists. It is especially exciting to find “middle” used as a technical term (Sumerian *murub*, Akkadian *qablītu*). Although it is used of an interval between two strings—not a single string as in Greece and India—a central string is strongly suggested elsewhere in the Mesopotamian system by the fact that nine canonical strings were numbered ‘epicentrically’ around the fifth string (that is, 123454321); and this central string *is* one of the two that comprises *qablītu*/MURUB.

- 1.8 All this was very exciting, suggesting as it did that the Greek and Indian systems might have been influenced—I use the word advisedly (cf. 2.11)—by a common source, and that Mesopotamian musical elements might be found so very far afield. Duchesne-Guillemin (1967) was the first to argue that the Greek string names, like the Mesopotamian, exhibited a centralized arrangement. This was vestigial, she thought, having suffered distortion in the passing centuries: based on Mycenaean depictions of seven-stringed instruments, Mesopotamian musical practice was transmitted to Greece *en bloc* in the Bronze Age. Though her argument was erroneous in many details (cf. 9.5-7), it is noteworthy that, before the discovery of the tablets, the centralization of the Greek strings had passed with little remark. Whether this signifies an historical relationship with Mesopotamia remains a matter of controversy.²²
- 1.9 Wulstan (1968), who brilliantly deciphered the Retuning Text (cf. 6.21-30) in collaboration with Gurney (1968), went on to argue that the Mesopotamian heptatonic cycle was directly analogous to the system found in Ptolemy, the Greek theorist of the second-century A.D. who proposed certain emendations to that of Aristoxenus and his successors. This parallel was rejected by Duchesne-Guillemin as an “anachronisme dangereux”.²³ Yet, as Winnington-Ingram demonstrated, Ptolemy’s insistence on the sufficiency of seven τόνοι rather than the thirteen of Aristoxenus or the fifteen of his successors,²⁴ represents some continuation of the old ‘modal’ octave species as against the Aristoxenean τόνοι or pitch keys.²⁵ Thus, in some ways, Ptolemy provides the best parallel that may be drawn with the Greek material (cf. 7.25, 10.37).

²² Cf. West (1993/4), 162 n.4.

²³ Duchesne-Guillemin (1969a).

²⁴ Ptol. *Harm.* 2.9; Cleonid. 12 (203.4-204.15); Aristid. Quint. 1.10; see further 7.5.

²⁵ Winnington-Ingram (1936), 62ff.

Nevertheless, his system must be used with caution, for it is clear that Ptolemy had very little first-hand evidence at his disposal for pre-Aristoxenean theory, as is shown by his open speculation on certain matters.²⁶

- 1.10 Despite his acceptance of early conclusions that are no longer tenable—for example Duchesne-Guillemin's (1965) pentatonic interpretation of U.3011—Picken's (1975) argument for a continuum of Mesopotamian musical influence between Greece and China is very cogent and finely nuanced.²⁷ Indeed, based on the strong cultural and trade alliance with the Greeks one might well extend the western limit to Etruria, where we regularly find seven-stringed lyres depicted in the Archaic and Classical periods.²⁸ The Etruscans enjoyed their own Orientalizing movement (cf. 5.25), and in fact other Mesopotamian lore has now been documented there.²⁹ Given Picken's great store of musicological and ethnological knowledge, and his lasting contributions to Chinese and Turkish ethnomusicology, his concise discussion has been unduly neglected.
- 1.11 But despite a number of general assertions about the probability of Near Eastern influence on Greek music—the potential connection with India remains still less explored³⁰—Lasserre (1988) is the only scholar to have attempted a more detailed correlation of the evidence. Lasserre's longtime scholarly interest in Greek music—his commentary on Pseudo-Plutarch's problematic *De musica* still awaits a successor³¹—makes his enthusiastic endorsement of Mesopotamian influence, which

²⁶ See e.g. Ptol. *Harm.* 2.6 (56.1ff.), 2.10 (62.18ff.).

²⁷ Picken (1975), 601ff.

²⁸ Gostoli (1990), XL-XLI comments on the seven-stringed Etruscan instruments: "si deve ora aggiungere l'eptacord rappresentato su un'anfora di Cerveteri, datata allo stesso periodo, che testimonia il rapido riverbero in terra etrusca dell'innovazione avvenuta in Grecia." Note that throughout the study I follow the convention of using "lyre" generically for various stringed-instruments of the crossbar type, as opposed to the curved or angled harp family.

²⁹ For hepatoscopy, Burkert (1992), 46-51; West (1997), 48.

³⁰ Kilmer (1971) suggested several parallels to specific Sanskrit terms which, as far as I know, have yet to be addressed. The best general discussion of an Indo- Mesopotamian link is Picken (1975), *loc. cit.* In theory, if one could establish anything with certainty about Indo-European musical practice, Mesopotamian heptatony, being stable and widely-practiced, might serve as a constant for studying the transformation of the Greek and Indo-Iranian daughter traditions, thus allowing us to give a scientific basis to parallels like those observed by Fox-Strangways (1914): see also 3.32.

³¹ See Anderson (1994), 139 n.45; Düring (1955).

he believed to be profound and placed in the ninth century or thereafter,³² particularly welcome. His arguments, however, were faulty in many details. His knowledge of the literature seems to have been somewhat cursory, leading him to use outdated texts and adopt speculative interpretations of the tablets (such as Duchesne-Guillemin's argument for vestiges of centralization in the Greek strings). All the same, Lasserre offered some interesting suggestions, ending merely with an appeal for an honest reassessment of the early stages of Greek musical history.³³

- 1.12 The eagerness to find a new explanation for the misty origins of ancient Greek music is understandable. But the claims advanced to date have been hasty and fail to give the Greeks their due; for there are fundamental differences between the Mesopotamian and Greek musical traditions which have not been addressed. On the other hand, the discovery that a cyclical heptatonic tone-system was widely known in the Near East for probably two millennia before Aristoxenus clearly threatens the accepted view of the Perfect System's development. Even if the potential historical connection is left unexplored, tenacious *a priori* assumptions about the 'evolution' of tone-systems—for example that pentatonic and other 'gapped' structures are a necessary precursor in the development of heptatony, or that a lyre tuning *must* contain the octave interval whatever the number of strings³⁴—are, for Greek music at least, deprived of their foundation, namely the paucity of pre-Aristoxenean source material. This is not to deny the existence of pentatonic and other 'gapped' systems then or now, nor to reject the historicity of the ἀρμονίαι in Aristides Quintilianus and the Libation Style of Olympus, nor to make a simple equation of the fifth-century ἀρμονίαι with the octave species, nor to turn a blind eye to the systematization which the σύστημα τέλειον clearly represents (cf. 3.33). But equally, these facts are no longer sufficient to exclude the synchronous or earlier existence of heptatonic music in a

32 The argument for a ninth-century terminus, based on the phonology of νήτη, is fallacious: see further 9.20.

33 Lasserre (1988), 82f. "Credo anche, e questa è la mia conclusione, che alla luce di questo nuovo chiarimento, sarà necessario riprendere su una base interamente diversa lo studio dei primi stadi della musica greca, quali ci li hanno presentati gli storici antichi assillati dall'eurematografia".

34 Sachs (1943) remains influential in this regard; thus Gombosi (1944), 171, who followed Sachs' theory of the pentatonic Greek lyre: ". . . the justified assumption that the compass of the lyre must always have been at least an octave". Wiora's (1959) study of 'pre-pentatonic' tone systems is an important refutation of this evolutionary prejudice: see further 3.21.

well-developed, ‘undefective’ form. Even if one uses the term with no pejorative connotations, the complexity of the evidence no longer allows us to characterize the early Greek structures as ‘defective’, nor to make the history of ancient tone-systems an ascent with heptatony its pinnacle. If an historical connection can be established between the diatonic methods of Greece and Mesopotamia, a new explanation for the non-diatonic Greek structures will be needed.

- 1.13 Putting aside our own long familiarity with heptatonic music, the Mesopotamian tablets should be regarded in the first instance as documenting a complex and idiosyncratic tone-system based upon a conscious use of acoustic resonance. For there are many ways that sound may be shaped into music even without the element of pitch; when this dimension is included, there are still an infinite number of ways that the frequency continuum may be divided musically. This need not, and often does not, involve precisely articulated, stable pitches, i.e. musical tones. But it is only between such tones that resonant intervals may be established. Even here, one may imagine many ways to combine resonant intervals; the diatonic articulation of the octave is peculiar to a single method, namely the alternation of those intervals known to the Greeks as consonant (σύμφωνος) fifths and fourths. This is the process which underlies the Retuning Text, as shown by the names of the seven tunings (which were so called from the interval on which the process was begun in order to achieve the desired pitch-set³⁵) and by the very mechanism which enables the progression from one tuning to the next, the ‘clearing’ of the tritone to a resonant fourth or fifth (see further 6.21-31).
- 1.14 The Greeks also knew this method of tuning, which they described as “taking the tuning through consonance” (ἡ λήψις διὰ συμφωνίας).³⁶ It yielded what to Aristoxenus and the other Greek theorists was part of the “diatonic genus” (γένος διάτονον). This method of tonal construction, which became known in modern times as ‘Pythagorean’ tuning—an acceptable label, since this is the structure which featured in the Pythagoreanizing musical discussions of Philolaus, Plato, and Nicomachus (cf. 8.0)—is more or less identical to that used in our own art tradition, allowing for equal temperament. The cuneiform tablets raise the astounding

³⁵ Kümmel (1970); Kilmer (1994), 1972.

³⁶ Aristox. *Harm.* 55; cf. Euc. *Sect. Can.* 17 (162.1ff.): αἱ παρανήται αἱ καὶ λιχανοὶ ληφθήσονται διὰ συμφωνίας οὕτως; ps.-Plut. *de Mus.* 38.1145b-c; Ptol. *Harm.* 1.16 (39.14ff.), 2.1 (44.1ff.); 2.9 (62.1ff.); Aristid. *Quint.* 2.14 (80.2f.): οἱ μὲν ἐξῆς . . . κατὰ συμφωνίαν λαμβάνονται.

possibility that the life cycle of the Mesopotamian system stretches from the eighteenth century B.C. or earlier down to the present day.

- 1.15 Naturally, however, such continuity would tell us little about the actual music made at various stages of this system's history. Quite apart from a myriad of other tuning methods practiced throughout the course of history and around the world, one finds heptatonic scales which are not like those of the tablets. In Greece, the Pythagorean was but one of several methods of tuning, which were classified by the theorists into three genera (γένη)—diatonic, chromatic, and enharmonic. In the system devised by Aristoxenus, and later with Ptolemy, the chromatic and diatonic genera were further divided into a number of χρώα or "shades".³⁷ Even within the theoretical classification of the γένος διάτονον, the Pythagorean method was responsible for but one shade, the διάτονον σύντονον or "tense diatonic".
- 1.16 Indeed, in the Classical period the diatonic seems to have played a subordinate role to the chromatic and enharmonic genera, before beginning an ascent to dominance in the Hellenistic period.³⁸ As late as Boethius in the sixth century A.D.,³⁹ theorists remembered that pride of place was given to scales which *cannot* be established solely by ἡ λήψις διὰ συμφωνίας (cf. 7.20): microtonal pitch-structures which sound strange and 'out-of-tune' to our ears, accustomed as we are to tunings much closer to those found in the Mesopotamian tablets. It is necessary, therefore, to distinguish carefully between the terms 'heptatonic' and 'diatonic', and to understand exactly what is meant by each. In many sources, including the early Philolaus as well as Aristoxenus himself, the tense shade of diatonic is treated as its normal form, being referred to merely as "the diatonic", and the γένος as a whole is also simply called διάτονον.⁴⁰ It is permissible, therefore, to refer to the 'Pythagorean' tuning method, both in Greece and Mesopotamia, as 'diatonic', without yet implying an historical connection between the two traditions, and recognizing that within Greek tradition the term may have been a relatively late coinage (cf. 2.26).

³⁷ Aristox. *Harm.* 21-7.

³⁸ Cf. West (1992), 383f., 390. See also 2.41.

³⁹ Boeth. *De inst. mus.* 1.21 (213.1f.): *enarmonium vero optime atque apte coniunctum*.

⁴⁰ Philol. fr. 44B6a D-K; Plato considers no other scale (*Ti.* 35b-36b); Aristox. *Harm.* 19 (quoted at 7.2 below) etc.; Adrastus ap. Theo Sm. 53.17-54.15; [Aristid. Quint.] 2.19 (92.19-22); Mart. Cap. 9.956; ps.-Censor. *de Mus.* 6.609.17; Anon. Bell. 2.26 (7.14ff.); etc. Cf. Barker (1982-9) 2.165 n.95.

- 1.17 'Diatonic' is often loosely applied to any scale or melody which shows a stepwise, 'tone-by-tone' arrangement, as opposed to a 'gapped' structure like pentatony, without specifying that the pitch-set be derived from the strict alternation of resonant fifths and fourths. But this usage presupposes an underlying norm which can give the concept of step and gap meaning. Very significantly, this normative tone-structure is what the Greeks called the γένος διάτονον. Diatony is a useful tuning convention to adopt as a norm, since it divides the octave into more or less uniform discriminations—the "whole tone" (τόνος)—or, if the alternation of fifth and fourth is continued, the "semitone" (ἡμιτόνιον). Moreover, this articulated grid results from a reliable, repeatable process: its use of resonance grants it a physically immutable structure which makes it a useful unit of measure—a sort of musical metric system—and accounts for persistent descriptions of the diatonic as the most 'natural' of the genera (cf. 7.3). But to view a pentatonic melody as 'gapped', or a roughly-stepwise scale as 'diatonic', imposes an anachronistic standard and reveals an abstraction of our musical conceptions. To a culture that never chained together resonant intervals to form the diatonic norm, pentatonic structures will not seem 'gapped' but rather as stepwise or 'diatonic'—using the term now in its loose modern sense—as anything else since, like any other group of tones, it simply articulates a continuum of pitch.
- 1.18 Despite its broad diffusion in antiquity, diatony (which I shall use henceforth in its proper ancient sense) should be seen as a culture-specific creation—presumably that of Mesopotamia where it is first attested, but at any rate not original to Greece. As the only musical fact plainly documented for both cultures, the detailed proof of Mesopotamian musical influence on Greece becomes a history of diatony. Yet it is important to remember that within the larger Mesopotamian musical culture the diatonic cycle, or 'Symphonic Circle' as I shall call it, was not proper to every musical genre, as seen from the Middle Assyrian song catalogue VAT 10101 (c. 1100 B.C.), where only two of thirty-two categories employ the tunings (cf. 5.21-3, 6.17, 7.60-61). In the category of *šitru*, a term of unknown meaning, songs occur in only two of the seven tunings; lovesongs (*irtu*) are alone in using all—a suggestive fact for Archaic Greek lyric (cf. 5.23-25). The total number of these is uncertain, but from the figures that survive it is clear that these categories are disproportionately large compared to the other genres. It would seem then that diatonic music was a specialized, but popular, form of music. The catalogue does not tell the whole story, of course, since the artistic evidence shows stringed instruments playing in a greater variety of contexts than the tablet suggests (cf. 5.22). Nevertheless, it is necessary to distinguish between the

general and extensive presence of West Semitic and Mesopotamian literary elements in Archaic Greek poetry, and that aspect of Greek Orientalizing music which may be connected specifically with the system of the tablets. There will have been common ground, but the two phenomena are not strictly coterminous.

- 1.19 And yet, even here, we cannot simply accept the system of the tablets as a sufficient document of the tonal realities of practicing musicians, for it is the business of theory to reduce the complex and subtle to the logical and systematic. There can be little doubt that, where heptatonic music was practiced throughout the ancient Near East, many different non-diatonic intonations would have been introduced at different times and places. The diatonic scales of the Retuning Text might be seen as providing a finite set of templates for the creation of heptatonic music, without recording any of the innumerable pitch shadings which doubtless existed.
- 1.20 All the same, one cannot completely reject the tablets as evidence for practical music, for to some degree the diatonic tunings must have been used more or less as documented—in pure, unshaded form. This may be deduced from the fact that the interval names, defined within the diatonic system by CBS 10996 (cf. 6.9), were used as a means of notating actual music.⁴¹ More conclusively, the lovesongs listed in VAT 10101 (cf. 6.17) occur in all seven tunings, yet the identity of these as a mutually coherent set depends on the interconnectivity granted by the pure diatonic tuning documented in the Retuning Text. Likewise, it is certain that the Greeks practiced diatonic music in a pure form. The very fact that scales were classified into genera serves to isolate the diatonic in its normal state from the chromatic and enharmonic. In the Classical period, we hear of the exclusive use of diatonic music in some areas of Greece (cf. 2.37). Even Ptolemy, so insistent on refinements of intonation, admits that “this is how the citharodes tune” (οὕτω γὰρ ἀρμόζονται οἱ κιθαρωδοί).⁴²
- 1.21 As the only known common ground between two very different cultural spheres, a history of diatony must stand *pars pro toto* for the movement as a whole. And yet it is striking that, for all their microtonal taste, the Greeks adhered strictly to the principle that a proper scale—diatonic, chromatic, or enharmonic—must have seven pitches. To what should we attribute this predilection? Aristotle insisted that there is nothing

⁴¹ See e.g. Kilmer (1960), 298ff.; (1994), 477.

⁴² Ptol. Harm. 2.1 (44.1ff.); cf. 1.16 (39.17f.).

magical or preternatural about this number, in music or otherwise.⁴³ As I shall demonstrate, Aristoxenus' cardinal rule of συνέχεια required every heptatonic scale, in each of the genera, to conform to minimum standards of diatony; likewise the Greek names of the consonances are shown to be dependent on diatony.⁴⁴ Far from being a universal musical constant, heptatonic music, though widely varying, is and was essentially dependent upon the diatonic method, with its characteristic seven-fold division of the octave. The focus of the investigation may therefore be broadened to include evidence not just for diatony, but for heptatony generally.

- 1.22 This leads to an important organological point. The creation of tone-structures with seven static pitches precisely tuned to resonant intervals would only be possible, among ancient instruments, with chordophones of at least seven strings. It is no coincidence, then, that the theorists of Greece, Mesopotamia, and India all presented their heptatonic systems in terms of stringed instruments. The term heptatonic itself—ἑπτὰ + τόνος < τείνω, “stretch”—reveals the original dependence of such tunings on strings. This allows for the easier identification of essential clues within the tangled mass of Greek evidence. For we must acknowledge that Oriental musical influence may have come by several channels. One cannot ignore the important cultural transactions with Lydia, or persistent reports which associate the αὐλός with Phrygia.⁴⁵ Within Greek lyre music we may distinguish the classical art of ἀρμονική from the ancient epic conventions known to Homer. Due to the nature of their construction, wind instruments would encourage the development of rather different

⁴³ Arist. *Metaph.* 14 1093a13ff.: ἀλλὰ διὰ τί αἷτια ταῦτα; ἑπτὰ μὲν φωνήεντα, ἑπτὰ δὲ χορδαὶ ἢ ἀρμονία [v.l. ἢ ἀρμονίαι], ἑπτὰ δὲ αἱ πλειάδες, ἐν ἑπτὰ δὲ ὀδόντας βάλλει (ἐνιά γε, ἐνια δ' οὐ), ἑπτὰ δὲ οἱ ἐπὶ Θήβας. ἄρ' οὖν ὅτι τοιοσδι ὁ ἀριθμὸς πέφυκεν, διὰ τοῦτο ἢ ἐκεῖνοι ἐγένοντο ἑπτὰ ἢ ἡ πλειὰς ἑπτὰ ἀστέρων ἐστίν; ἢ οἱ μὲν διὰ τὰς πύλας ἢ ἄλλην τινὰ αἷτιαν, τὴν δὲ ἡμεῖς οὕτως ἀριθμοῦμεν (“But why are these [sc. numbers] causative? Seven are the vowels, seven strings a tuning, seven are the Pleiades, animals lose their teeth in the seventh year (at least some, others do not), there were seven [sc. heroes] against Thebes. And so is it because this number is naturally of such kind that those [sc. heroes] were seven, or that the constellation is of seven stars? Or were there not seven [sc. heroes] because of the gates or some other reason, and the constellation because we count it so?”).

⁴⁴ See further 7.26-39; cf. Franklin (2002).

⁴⁵ See for example ps.-Plut. *de Mus.* 1132f., drawn from the *Συναγωγή τῶν περὶ Φρυγίας* (*Compilation of Phrygian Matters*) of Alexander Polyhistor (FGrH 273F77). See further 2.5, 2.11, 2.15, 3.33.

tonal phenomena—an issue which is not often recognized.⁴⁶ Here resonance, needing at least two sounding voices, could play only a very minor role, or be altogether irrelevant. This acoustical incompatibility is echoed by the well-known rivalry between λύρα and αὐλός, epitomized by the progressive rejection of the latter from the music lesson, as Aristotle reports,⁴⁷ as well as the disdainful judgement of Aristoxenus, whose musical achievements were devoted to lyre-based ἁρμονική:

ὁ μέντοι Ἀριστόξενος προκρίνει τὰ ἐντατὰ καὶ καθαπτὰ τῶν ὀργάνων τῶν ἐμπνευστῶν, ῥάω [ν.λ. ῥάδια] εἶναι φάσκων τὰ ἐμπνευστὰ· πολλοὺς γὰρ μὴ διδαχθέντας αὐλεῖν τε καὶ συρίζειν, ὥσπερ τοὺς ποιμένας.⁴⁸

Aristoxenus judges stringed instruments superior to winds, saying that winds are easy; for many people, such as shepherds, play the *aulos* and *syrinx* with no formal training.

- 1.23 What these rustic musics were like is impossible to say, since they were not subject to the same theoretical scrutiny accorded by Aristoxenus and others to the urbane art-music of the fifth and fourth centuries. It is easy to imagine that they represented the continuation of traditions with roots much older than any musical importations from the Near East, just as folk music of the Greek mountains today, like that of the Balkans, preserves very ancient qualities. That the disparity of intonation between λύρα and αὐλός remained a real issue even in the fourth century is made clear by Aristoxenus, who speaks of misguided efforts to understand the peculiarities of αὐλός-music through the intonational norms of lyre-based ἁρμονική.⁴⁹ He himself was an authority on the boring of the αὐλός, having written a treatise on the subject.⁵⁰ This makes all the more important his observation that auletes used every technique at their disposal to match their intonation to the μέλη ἡρμοσμένα which were best achieved on the lyre.⁵¹

⁴⁶ But see Anderson (1966), 23-6; (1994), 140f.; Schlesinger (1939).

⁴⁷ Arist. *Pol.* 8.6.1340b20-1341b8.

⁴⁸ Aristox. fr. 95 = Ath. 4.174e.

⁴⁹ Aristox. *Harm.* 39: ἃ δέ τινες ποιοῦνται τέλη τῆς ἁρμονικῆς καλουμένης πραγματείας . . . οἱ δὲ τὴν περὶ τοὺς αὐλοὺς θεωρίαν καὶ τὸ ἔχειν εἰπεῖν τίνα τρόπον ἕκαστα τῶν αὐλουμένων καὶ πόθεν γίγνεται· τὸ δὲ ταῦτα λέγειν παντελῶς ἐστὶν ὅλου τινὸς διημαρτηκότος.

⁵⁰ The *Περὶ αὐλῶν τρήσεως*: see Aristox. fr. 101, cf. fr. 100.

⁵¹ Aristox. *Harm.* 43: σχεδὸν δὴ φανερόν, ὅτι δι' οὐδεμίαν αἰτίαν εἰς τοὺς αὐλοὺς ἀνακτέον τὸ μέλος, οὔτε γὰρ βεβαιώσει τὴν τοῦ ἡρμοσμένου τάξιν τὸ

- 1.24 His polemical stance merely reveals that other musicians or theorists at the time were in fact interested in the different tonal relationships which arose from the idiosyncratic construction of the αὐλός. There is, however, no record of a theoretical work advocating a formal tone-system based on that instrument—much less one which ever challenged the supremacy of the lyre tunings. And yet for all the philological shortcomings of the work, Schlesinger (1959) cannot be entirely ignored, for the acoustical peculiarities of the Greek αὐλός must surely have left their mark in some way, accounting in part perhaps for the peculiarities of the genera (cf. 2.35, 3.35). Archytas, who also wrote a treatise on the boring of the αὐλός,⁵² gave very precise analyses of actual musicians' tunings in terms of the smaller superparticular ratios.⁵³ Aristoxenus himself, measuring the intervals of the genera by fractions of a tone, seems to have described, in less precise terms, these same tonal realities.⁵⁴ This may indicate the influence of auletic intonation with its more abstruse harmonic relationships; many other Pythagoreans, including Philolaus, are said to have cultivated the art of the αὐλός.⁵⁵ It is possible that Xenophon's description of a citharist "tuning his instrument to the αὐλός" (συνηρμοσμένη τῇ λύρᾳ πρὸς τὸν αὐλόν) refers not merely to using it as a pitchpipe, but to matching its gamut more closely.⁵⁶ Perhaps this is the meaning of ἑναυλος κιθάρισις, which Philochorus applied to a style of *cithara* music influenced by the auletic τέχνη and practiced from the time Epigonus and his school in the later Archaic period (see also 7.57).⁵⁷

εἰρημένον ὄργανον οὐτῶ. εἴ τις ᾤθη δεῖν εἰς ὄργανόν τι ποιῆσθαι τὴν ἀναγωγὴν, εἰς τοὺς αὐλοὺς ἦν ποιητέον, ἐπειδὴ μάλιστα πλανᾶται καὶ κατὰ τὴν αὐλοποιῶν καὶ κατὰ τὴν χειρουργίαν καὶ κατὰ τὴν ἰδίαν φύσιν ("Indeed, it is quite clear that for no reason is the μέλος to be referred to αὐλοί, for the instrument named cannot make stable the structure of attunement, and, if one thinks the reference must be made to some instrument, it must not be to the αὐλοί, since it wanders most [in pitch] due to αὐλός-construction, playing technique and its own peculiar nature").

⁵² The περὶ Αὐλῶν: Ath. 4.184e.

⁵³ On the practical basis of Archytas' work, see Winnington-Ingram (1932); Barker (1982-9), 2.50ff.

⁵⁴ See Winnington-Ingram (1932).

⁵⁵ Ath. 4.184e.

⁵⁶ X. *Smp.* 3.1.

⁵⁷ Philoch. *FGrH* 328F23 = Ath. 14.637f. See also Barker (1982) and (1989), 1.300 n.205.

1.25 Yet with its useful uniform division of tonal space, the diatonic system of Mesopotamia seems to have been accessible to all instruments and voice, to judge from scenes of concerted performance such as the Nineveh reliefs. This might also be suggested by the use of *embubu* (“reed pipe”) to designate one of the diatonic tunings in the tablets.⁵⁸ In Greece, auletes tried to match the intonation of ἀρμονική, the art of stringed-instrument tuning—often with middling results.⁵⁹ It is no surprise, then, to read of milestones in the harmonization of lyre and *aulos*. The two are mentioned already in Homer and depicted as playing together throughout the Archaic period.⁶⁰ Pausanias records that the ancient Spartans would march to battle “not with trumpets, but to the melodies of *aulos* and the accompaniments of *lyra* and *cithara*” (οὐ μετὰ σαλπίγγων . . . ἀλλὰ πρὸς τε αὐλῶν μέλη καὶ ὑπὸ λύρας καὶ κιθάρας κρούσμασιν); the same ensemble appears in the Assyrian victory parades.⁶¹ When the great aulete Olympus took the first step towards the enharmonic γένος by omitting certain notes of the diatonic from his Libation Style, he must have been exploring a citharistic tuning; or his melody may have been understood against such a structure (cf. 7.62).⁶² In the early sixth century, the aulete Sakadas of Argos could modulate

⁵⁸ Cf. Lasserre (1988), 75. But see the warnings of Crocker (1997), 190 against interpreting such terms too literally; cf. also 6.9.

⁵⁹ Aristox. *Harm.* 42: πάντων γὰρ τούτων ὑπαρχόντων οὐδὲν ἥττον τὰ μὲν πλείω διαμαρτάνουσιν οἱ αὐληταὶ τῆς τοῦ ἡρμοσμένου τάξεως . . . ὥστ’ εἶναι φανερόν, ὅτι οὐδὲν διαφέρει λέγειν τὸ καλῶς ἐν τοῖς αὐλοῖς τοῦ κακῶς (“For despite the existence of such [sc. compensatory] devices, nonetheless αὐλός-players for the most part badly miss hitting the arrangement of the μέλος ἡρμοσμένον . . . so that it clearly makes no difference to talk about good vs. bad αὐλός-playing”); *Harm.* 43: ἕκαστα τῶν αὐλουμένων μεταβάλλει <κατὰ *suppl. Meibom*> τὰς αἰτίας ἀφ’ ὧν αὐλεῖται (“each thing played by an αὐλός misses the mark due to causes inherent in the playing of an αὐλός”); cf. Pratin. fr. 1.8-12 (*PMG* 708) = Ath. 14.617b, a rebuke to the hybris of the αὐλός, where παροίνων (“drunken”) and παραμελο- (“missing the μέλος”) must refer to the instrument’s wild and orgiastic intonation.

⁶⁰ Hom. *Il.* 18.495; cf. Archil. fr. 93a.5 (West); *h. Merc.* 452 (see 5.5-6); Thgn. 761; Pi. *I.* 5.27, *N.* 9.8, *O.* 3.8, 7.12, fr. 140b2f.; X. *Smp.* 3.1; D. S. 5.49.1; Lucian *Salt.* 16: παίδων χοροὶ συνελθόντες ὑπ’ αὐλῶ καὶ κιθάρᾳ, speaking of the ancient hyporcheme danced for Apollo at Delos, which lasted until Lucian’s day: see Allen/Halliday/Sikes (1936), 224 *ad h. Ap.* 162; S. E. M. 6.9-10 (164.25f.), speaking about the time of Solon; cf. 6.24 (168.3-6) of Spartan battle music.

⁶¹ Paus. 3.17.5.

⁶² Aristox. fr. 83 = ps.-Plut. *de Mus.* 1134f-1135b; see also 7.21, 7.39.

between the Dorian, Lydian, and Phrygian tunings in his τριμελής νόμος (“Etude in Three Modes”)⁶³—a distinctly citharistic fusion (cf. 7.57). Philochorus recalled that the citharist Lysander of Sicyon, perhaps in the early fifth century,⁶⁴ “was the only one until then who interchanged instruments . . . and first organized an ensemble around himself”.⁶⁵ Likewise, Dion’s use of the *cithara* to be play Dionysian libation music—normally the preserve of the *aulos*⁶⁶—was remembered as a landmark.⁶⁷

- 1.26 This need for mutual adjustment would be more important in ‘serious’ musical environments, while the bucolic traditions dismissed by Aristoxenus could persevere on the fringe of formal technical refinements deriving from lyre music. Indeed, the different musical languages of stringed and wind instruments seem to have lasted for centuries in the face of the regularizing effect of the Perfect System. Aristides Quintilianus could still observe that

οὐ γὰρ ταὐτὸν ᾠδῆς εἶδος ἐν τε κιθάρα καὶ αὐλᾷ πρέπον· εἰ γὰρ τοῦτο, οὐτ’ ἂν τῆς ποικιλίας ἐδέησεν αὐτῶν οὐτ’ ἂν διαφόρως οἱ ἀκούοντες ἐκηλοῦντο.⁶⁸

The same species of song is not appropriate to both *cithara* and *aulos*: for if this were the case, there would be no need for their variety, nor would listeners be charmed in different ways.

- 1.27 For the Classical and Archaic periods, then, it is all the more believable that any vestige of Mesopotamian heptatonic music will be more obvious when connected with the essential technology of chordophones. Indeed, the more the tablets describe a practical and not theoretical art, the easier it should be to detect any traces of the τέχνη within the composite Greek music-stream, later accretions or assimilations notwithstanding. Needless to say, of course, the evidence for these questions must be, as much as possible, pre-Aristoxenean. The *Elementa Harmonica* itself is extremely valuable, containing as it does many indications and outgrowths of earlier musical concerns; I have drawn on it extensively. But many established conventions were

⁶³ Ps.-Plut. *de Mus.* 1134b.

⁶⁴ West (1992), 79.

⁶⁵ Philoch. *FGrH* 328F23 = Ath. 14.638a: ὄργανον μετέλαβεν μόνος τῶν πρὸ αὐτοῦ, καὶ . . . χορὸν περιεστήσατο πρῶτος.

⁶⁶ Poll. *Onom.* 4.84.

⁶⁷ Menaechmus *FGrH* 131F7 = Ath. 14.638a.

⁶⁸ Aristid. Quint. 2.12 (77.26-28).

transformed in the service of the new, integrated system. A particularly unfortunate example is the original connection between the string names and their musical function: the architects of the σύστημα τέλειον naturally kept the traditional names, but these were lifted away from their specific disposition on the lyre's crossbar to the remote realm of abstract pitch (cf. 9.30-32). Hence Aristoxenus, though a key witness, is both a positive and negative one, and it is important to distinguish between the two. To do this, however, it is necessary to understand the shadowy musical events which preceded him, and so care must be taken to avoid the logical snarl which plagues all the extant theorists (cf. 9.25-26).

- 1.28 Key sources for the musical development of the Archaic period are the essays into historical musicology undertaken in the late fifth and fourth centuries B.C. by such figures as Glaucus of Rhegium, Heraclides of Pontus, Phaenias of Eresus, and the further works of Aristoxenus himself. By the time of these important researches, however, the details of a three-hundred-year old cultural transformation could only be sketchily remembered. Worse still, these works survive only as fragments embedded in late, often uncomprehending, writers like Athenaeus and Pseudo-Plutarch. These compilers juxtaposed earlier material, often without identification of or distinction between sources, which themselves could differ (though ps.-Plutarch at least recognized this much⁶⁹). Further material bearing directly and indirectly on the pre-Aristoxenean heptachordal θεωρία is widely scattered throughout Greek and Latin literature. In addition to combing the entire corpus of music theory, I have drawn valuable clues from Alcman, the Homeric *Hymn to Hermes*, Parmenides, Philolaus, Ion of Chios, Aristophanes, Archytas, Plato, Aristotle, and Plutarch, among many other sources.
- 1.29 Multivalent and garbled, these testimonia can never be fully sorted out. But it may be possible to sketch a course of development based on them, from Terpander to the New Music of the late fifth century, sufficient to explain how elements of the Mesopotamian system could persist in recognizable form, and how these could provide the foundation for the subsequent development of the σύστημα τέλειον. The problem in understanding the post-Homeric melic music has always been the lack of contemporary evidence. But if it is allowed that Mesopotamian diatony enjoyed a vogue at the height of the Greek love-affair with all things oriental, and that, as with other aspects of their culture, this movement had its lasting effects, we can use the tablets to bring the early Greek evidence into the clearer light of written

⁶⁹ Ps.-Plut. *de Mus.* 1131f.

documentation. It should thus be possible to extrapolate a continuous line of development across the lacuna and piece together a tolerable history of the Orientalizing movement in Greek music. If this is successful, the Greek adoption and transformation of the diatonic system will provide a very detailed example of the Orientalizing process, and so should be of value for understanding, in more general terms, the transmission of technical material and the cultural dynamics of the period.

PART ONE

THE MELIC REVOLUTION

2.0 Terpander's Lyre: The Orientalizing Period in Greek Music

- 2.1 What evidence is there then that, like other reputedly Greek discoveries such as the 'Pythagorean' theorem, the diatonic tuning method came to Greece from the urbane Near East? It is certain that the σύστημα τέλειον, as known from Aristoxenus, was a relatively late invention. Pioneered by forgotten ἁρμονικοί ("harmonists") in the schools of Eratocles, Stratoniceus, Pythagoras of Zacynthus, and Agenor of Mytilene,¹ it seems to have been brought to a high polish in the fourth century B.C. by the conservative innovations of the Musician himself, as the ancients called Aristoxenus.² As I shall argue in 7.0, the σύστημα τέλειον was the culmination of fifth-century efforts to find a coherent means of harmonizing contemporary musical developments—perhaps represented by the ἁρμονία of Aristides Quintilianus—with an older heptachordal θεωρία. It revolutionized the course of subsequent Greek art-music no less than Bach's equal temperament did our own, facilitating the frequent mixing of scale and style which characterized the avant-garde New Music of the later fifth century, which was condemned by Plato as "panharmonic",³ but had become popular practice by the mid-fourth century. By any interpretation, however, the chronology of the Perfect System is relatively well-documented and, despite its seeming resemblance to the cyclical heptatonic system of Mesopotamia, it is impossible to suppose an immediate historical connection between the two. If there was in fact some genetic relationship between the Greek and Mesopotamian systems it will need to have been more remote, and such evidence as there might be should be sought in much earlier sources.
- 2.2 The problem with studying the cultural developments of this early period is that, the farther one retreats from the Classical period—itself all too murky—through the Archaic to the time of most intensive Oriental influence, there is less and less evidence. The material that we do have is often badly jumbled and contradictory. But one fact

¹ Cf. Burkert (1972) 372 n. 12; Barker (1978).

² The best detailed treatment of the Perfect System and its history is still Winnington-Ingram (1936) as a whole. For a good introduction see Barker (1982-9), 2.11-27; West (1992), 223-233; for its antecedents and the ἁρμονικοί in general see Burkert (1972) 372 n.12; Barker (1978); Thorp (1991). On the conservatism of Aristoxenus in the face of contemporary music, and how this may have influenced his formulation of the σύστημα τέλειον, see 7.56.

³ Pl. *Resp.* 3.399c-d.

emerges clearly from persistent traditions in Classical and post-Classical sources: the early Archaic period was a time of substantial musical change. A sizable cast of mythical, semi-legendary, and historical musicians—many associated with ‘Asia’⁴—were remembered for groundbreaking achievements in musical practice and instrument design.

- 2.3 Looming large among these is Terpander, the ‘gleeman’ of Lesbos who, four times victorious at the Pythian festival,⁵ was the most celebrated musician of the early seventh century, “the best of the citharodes in his time” (ἄριστον τῶν καθ’ ἑαυτὸν κιθαρῳδῶν).⁶ Leaving aside for now the mythological associations with the instrument—Hermes, Apollo, Orpheus, Amphion, Thamyras, Linus, Heracles (though these too will be important)—Terpander was unanimously associated with the classical form of heptachordal music which was practiced throughout the Archaic period and into the fifth century; often he is said to have been the inventor (πρῶτος εὕρετής) of the seven-stringed lyre. Best known is the fragment of a song, attributed to Terpander himself and now generally accepted as authentic:

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- ⁴ See for example Ath. 14.624b; ps.-Plut. *de Mus.* 1136c. The list from here and elsewhere includes Philammon, Kepion, Olympus, Coroebus of Lydia, Torebus (probably a corruption of Coroebus), Hyagnis and Marsyas of Phrygia, Tyrrhenus, Cinyras of Cyprus; Amphion is said to have learned the “the tuning of the Lydians” (τὴν τε ἁρμονίαν τὴν Λυδῶν), Paus. 9.5.7-8. Cf. Farmer (1957), 250ff.; Lasserre (1988), 72f. The Greek perception of “Asia” in these traditions is discussed below.
- ⁵ Ps.-Plut. *de Mus.* 1132e: [sc. Τέρπανδρος] τὰ Πύθια γὰρ τετράκις ἐξῆς νενικηκῶς ἀναγέγραπται.
- ⁶ Plut. *Inst. lac.* 238c. For Terpander’s Lesbian origin, see below. All told the early seventh-century *floruit* is best attested: see first the discussion in Ath. 14.635e-f. According to the late-fifth century testimony of Hellanicus (*FGrH* 4F85a = Ath. 14.635e)—quite possibly based on epigraphic evidence—Terpander won a victory at the first Carneian games in Sparta, during the twenty-sixth Olympiad (676-673), and lived in the time of Midas who died c. 696 (*FGrH* 4F85a = Clem. Al. *Strom.* 1.21.131); Glaucus of Rhegium put him before Archilochus in his *On the Ancient Poets and Musicians* (*FHG* 2 p. 23 fr. 2 = ps.-Plut. *de Mus.* 1132e); Phaenias by contrast dated him after Archilochus (fr. 33 = Clem. Al. *Strom.* 1.21.131); so too the *Parian Marble* (third century) mentions him under the date 645-43 (*FGrH* 239A34); one tradition (*Suda* s.v. Τέρπανδρος) makes him a third-generation descendent from Homer. Gostoli (1990), IX-XI supports the Hellanic dating.

σοὶ δ' ἡμεῖς τετράγηρυν ἀποστέρξαντες αἰδάν
ἐπτατόνῳ φόρμιγγι νέους κελαδήσομεν ὕμνους.⁷

Putting aside four-voiced song, we shall sing
New hymns to the heptatonic phorminx.

- 2.4 The strong disjunction between “four-voiced song” and a seven-stringed lyre on which to sing new hymns suggests the juxtaposition or even confrontation of two distinct styles of music. It is very attractive to connect the “heptatonic” lyre (ἐπτάτονος φόρμιγξ) with the diatony of Mesopotamia, for the career of this celebrity corresponds quite closely to the peak of the so-called Orientalizing epoch, conventionally dated between 750-650. A general Orientalizing process was operative in the Aegean from the Bronze Age onwards, and is “better understood as a dimension of Greek culture rather than a phase”.⁸ At the same time, one must honor the various broad epochs into which Hellenic history is traditionally articulated. The Geometric and Archaic periods are clearly bridged by the most concentrated East-West transactions since the collapse of the Mycenaean palace culture (c.1100 B.C.). There was renewed prosperity and interaction with the layered cultures of the Near East, in which the ancient urban cultures of Mesopotamia—Assyria, Babylon, Sumer—had always played a central role. It was a renaissance stimulated by the acquisition—and in some cases, perhaps, reacquisition (cf. 4.25)—of Near Eastern

⁷ Terp. fr. 4 (Gostoli). I have adopted Gostoli's text, with the exception of the Doric form τετράγαρυν; minor details of the fragment are in doubt—e.g. σοὶ δ' ἡμεῖς vs. ἡμεῖς τοι—but these are of no concern here. More important in support of the fragment's authenticity is the Attic correction of τετρ-, which shows the verses to be post-Homeric, while at the same time there is no obvious false archaism (Janko, personal communication); this detail is also important for confirming the strong literary evidence that Terpander was working within the *living* hexameter tradition (see below). For the seven-stringed lyre of Terpander see e.g. ps.-Plut. *de Mus.* 1141c; Plin. *N.H.* 7.204; Cleonid. 12 (202.11f.); Nicom. *Exc.* 1 (266.8-17) and ap. Boeth. *De inst. mus.* 1.20 (206.10f.), who variously qualify the tradition as we shall see); Clem. Al. *Strom.* 6.16.144; *Suda* s.v. Τέρπανδρος; Georg. Syncell. *Chronog.* 403 (253.21 Mosshammer); the tradition that Terpander added an eighth string is false: see 8.64-68.

⁸ Morris (1992), 130.

science, religion, art, literature, and literacy. The effect of this movement on Greek culture was deep, and the extent of the debt is becoming ever clearer.⁹

- 2.5 Alongside everything else, the Greeks must have been exposed to Oriental musical arts at this time; in view of the strong influx of ideas already documented in other areas, it is easy to think that in this subject too they may not have been unaffected. Yet despite a number of generalities about Asiatic musical influence on Greece, the possibility that the Orientalizing epoch *per se* should have had a well-defined musical component has not been acknowledged. More often scholars look to Lydia and Phrygia, for which there is indeed clear evidence of musical contact (cf. 1.22, 2.11, 2.15).
- 2.6 Yet the cultural dynamics of the period in question were dominated by the westward expansion of the Assyrian empire to the Mediterranean under Tiglathpileser III (c. 744-727) and Sargon II (c. 722-705). Phoenician trading and colonial activity of the ninth and eighth centuries had reinvigorated, after the Dark Age, the influx to Greece of West Semitic cultural elements, some of which were Mesopotamian in origin. But Assyrian expansionism now brought the Greeks much more directly within the Mesopotamian cultural sphere. In particular the policy of systematic deportation, whereby conquered and insurgent peoples were shuffled between the provinces of the empire in hundreds of thousands, must have done much to establish an Assyrian cultural *koine*. The Greeks themselves were not absorbed by the Assyrians; even the marginal Cyprus, which paid tribute on occasion, was never officially incorporated into the political structure. All the same, a sharp spike of Orientalizing interest is evident in Greek culture at this time—not only in Cyprus, but in most parts of the Aegean itself.¹⁰
- 2.7 We need look no further than the alphabet for an example of a complex and detailed Oriental art adopted by the Greeks through close bilingual contact—a process described by Herodotus as παραλαβόντες διδασχῇ (cf. 9.22, 10.5).¹¹ More suggestive still is the strong resonance between early Greek poetry and Near Eastern traditions,

⁹ For this period specifically, see first Burkert (1992); for cross-cultural contact in the eastern Mediterranean generally, West (1997); Lefkowitz/Rogers (1996); Morris (1992); Frankfort *et al.* (1946), 373-387.

¹⁰ For the affairs of this period see Braun (1982); Culican (1991); Aubet (1993), 43-49; for Cyprus, Karageorghis (1982).

¹¹ Hdt. 5.58. See generally Powell (1991); Woodard (1997).

now established beyond any lingering doubt.¹² Many of these elements are due to gradual absorption and exchange over centuries of East-West relations. Others parallels, however, seem to derive specifically from the Neo-Assyrian age.¹³ The westward movement of this poetic material must have been accompanied to some extent by musical ideas.

- 2.8 The system of diatonic music documented by the tablets would have been readily exportable across national boundaries. Consistent over fifteen hundred years or more, the standardized Mesopotamian vocabulary indicates a formal tradition of music—we may call it a classical practice—which, while doubtless growing and changing over the centuries, clearly retained certain essential and identifiable features across the continually changing political and cultural map of second and first millennia Mesopotamia. Such an artform, being less idiomatic and culture-specific than regional folk traditions, could serve as a musical *lingua franca*, jumping easily from court to court as a mark of high culture. Indeed, the diatonic system was characterized by such movement throughout its history, coming to Assyria from the Babylonians, who had adopted it in their turn from Sumer. The constant nature of resonance would allow the diatonic scales to be readily reproduced by anyone anywhere, even beyond the bounds of Mesopotamia proper. The actual music created using such a ‘metric’ system, with all the heptatonic variation wrought by time and place, might not be equally exportable in every case. But in its pure form, the diatonic tuning method could provide malleable raw material for the creation of new ‘tempered’ traditions.
- 2.9 We are fortunate to have an example of this process in the Hurrian hymns found at Ugarit,¹⁴ a melting pot of cultures with seven attested languages and five scripts.¹⁵ Here, by the middle of the second millennium B.C., the Mesopotamian system had been taken over across a linguistic barrier with Akkadian terms being pressed to service in an undoubtedly different musical environment, as is shown by Hurrian

¹² See especially West (1997); (1988), 169-72; Burkert (1992).

¹³ West 1997, 375-80, 587.

¹⁴ For the Hurrian hymns, see Laroche (1955), 327-335 and plates cviii-cix; Laroche (1968); Güterbock (1970); Dietrich/Loretz (1975); Kilmer/Crocker/Brown (1976), 15; West (1993/4) 171ff. Deciphering attempts: Wulstan (1971); Kilmer (1974); Duchesne-Guillemin (1975); (1977); (1980); Vitale (1982); West (1993/4).

¹⁵ See Morris (1992), 107.

musical vocabulary which has no Akkadian counterpart.¹⁶ Ugarit's situation on the Levantine coast made it an important crossroads for goods, news, and knowledge coming from and going to all parts of the Eastern Mediterranean. For even if the diatonic art subsequently disappeared from Ugarit, it surely came to Phoenecia with the Neo-Assyrian conquests.

- 2.10 We might seek a specific point of contact in a city like Sidon which, according to the Phoenician History written by Philo of Byblos, drawing on the ancient writings of Sanchuniathon, “first discovered the singing of hymns” (πρώτη ὕμνον ᾠδῆς εὔρε)¹⁷—a genre proper to the lyre (cf. 5.24). But the Levant as a whole saw the continual interaction of Greeks, Cypriotes, Phoenicians, and others, and it may be misleading to think in terms of clearly separated nationalities or even ethnicities; on Cyprus in particular, Greek and Phoenician communities coexisted for generations in close proximity, and extensive bilinguality must be assumed.¹⁸ It was here that the adaptation of the Phoenecian alphabet, by Cypriot Greek scribes who had remained literate since the exodus from the Mycenaean mainland, most likely took place.¹⁹ When one considers that this double society was brought within the penumbra of Mesopotamian culture at the height of Assyrian influence, Cyprus emerges as the epicenter of the cultural convergence needed for the musical transmission in question. Against this backdrop, Cinyras becomes an important symbol of Greco-Asiatic musical syncretism. A priest of Aphrodite Ourania, he was the eponymous founder of the temple musicians of Paphos, the Kinyradai whose name derives from Phoenician **bʿnê kinnûr*, “sons of the lyre”.²⁰ His origin in either Byblos or Assyria parallels Aphrodite's historical descent from Astarte, and ultimately Ishtar, thus documenting in mythological form the westward diffusion of Mesopotamian musical knowledge and cosmic speculation, and providing an archetype for the union of the two disciplines that predicts the work of the Pythagoreans—for whom the number seven, proper to the diatonic method (cf. 1.21), had magical significance.²¹

¹⁶ On the adaptation of the Akkadian terminology, see Laroche (1973); for the uniquely Hurrian terms, Kilmer (1971), 144f.; West (1993/4), 171f.

¹⁷ Ph. Byb. *FGrH* 790F2.

¹⁸ See Morris (1992), esp. 124-131.

¹⁹ Woodard (1997).

²⁰ See West (1997), 57.

²¹ Arist. *Metaph.* 14.1092b26ff. Cf. 5.32.

- 2.11 Thus, the only barrier between Oriental art and science and the more remote Greeks of the Aegean was a wide-open door. This is not to overlook the possibility that the Greeks themselves influenced their Eastern neighbors, as seen most clearly in Cyprus. A mutual transaction also seems probable in the case of the Lydians, with whom the Greeks had intensive contact in the later seventh century (cf. 2.15).²² But in the Neo-Assyrian period specifically, the centrifugal force of Mesopotamian culture was literally overwhelming for many areas; in such a case, it is still possible to speak of a more unilateral influence. In any case, the task at hand is to track the ancient diatonic tradition to, and not from, Greece.
- 2.12 Terpander himself has well-attested connections with ‘Asia’. He was the first and greatest citharode of the long-running Lesbian dynasty which dominated the Aegean music scene in the seventh-century.²³ This school (γένος) produced the other major talents Arion, Sappho, and Alcaeus, as well as lesser entertainers like Lesches and perhaps Cepion, who cast the *cithara* in its classical form.²⁴ The efflorescence was considered to have ended in the sixth century with Periclitus,²⁵ though there was a

²² Cf. West (1992), 332.

²³ Divergent origins are recorded for Terpander by the *Suda* s.v. Τέρπανδρος, but his Lesbian roots are best attested: Pi. fr. 125 (S-M) = Ath. 14.625d; Tim. *Pers.* fr. 15.227f. (PMG 791); *Marm. Par.* (FGrH 239A34); D. S. 8.28 ap. Tz. H. 1.388; Str. 13.2.4 (also for Arion); Plut. *De sera num. vind.* 558a; ps.-Plut. *de Mus.* 1133c (also for Periclitus), 1141c; Dem. Phal. ap. Schol. E and Q *ad Od.* 3.267 (144 Dindorf); Heraclid. *Lemb. Exc. polit.* 11, deriving from the *Politeia* of Aristotle: see Dilts (1971); Nicom. *Exc.* 1 (266.10ff.) and ap. Boeth. *De inst. mus.* 1.20 (206.10); Aristid. *Or.* 2.336; Zen. 5.9 (1.118 Leutsch/Schneidewin); St. Byz. p. 101.1f. Meineke; Phaen. fr. 33 (= Clem. Al. *Strom.* 1.21.131), also for Lesches; Hsch. s.v. μετὰ Λέσβιον ᾠδόν; Phot. *Lex.* s.v. μετὰ Λέσβιον ᾠδόν; Ael. Dion. λ 7 = Eustath. *ad Il.* 9.129; Clem. Al. *Strom.* 1.16.78. On the Lesbian school, cf. West (1992) 334f.

²⁴ Ps.-Plut. *de Mus.* 1133c: ἐποιήθη δὲ καὶ τὸ σχῆμα τῆς κιθάρας πρῶτον κατὰ Κηπίωνα τὸν Τερπάνδρου μαθητὴν; cf. West (1992), 330 n.8.

²⁵ Ps.-Plut. *de Mus.* 1133d: τελευταῖον δὲ Περικλείτον φασὶ κιθαρῳδὸν νικῆσαι ἐν Λακεδαίμονι Κάρνεια. τὸ γένος ὄντα Λέσβιον· τούτου δὲ τελευτήσαντος, τέλος λαβεῖν Λεσβίοις [ν.λ. Λεσβίους] τὸ συνεχὲς τῆς κατὰ τὴν κιθαρῳδίαν διαδοχῆς (“They say that Periclitus was the last citharode of the Lesbian school to win the Carneian festival in Lacedaimon; and when he died, the Lesbians’ continuous citharodic dynasty met its end”). West (1992), 330, traces this passage to Hellanicus’ study of Carneian victors.

resurgence in the early fifth century (c. 480) with the citharode Aristoclitus, who could still be considered a member of the Terpandrian school, and his modernist student Phrynis (cf. 2.38-40, 8.63).²⁶ So dominant was this tradition that μετὰ Λέσβιον ᾠδόν (“after a Lesbian singer”) became proverbial for “taking second place”.²⁷ It seems to have been exploited by the Old Comic playwright Cratinus in his lost *Cheirons*, perhaps in a citharodic gag about a chorus of lyre-teaching centaurs.²⁸ But already Sappho could write “outstanding like the Lesbian singer among others” (πέρροχος, ὥς ὅτ’ ᾄδους ὁ Λέσβιος ἀλλοδάποισιν).²⁹ According to Aristotle, the proverb referred originally to Terpander himself, a fitting tribute to his quarter-century hegemony at the Pythian festival.³⁰

2.13 These reports—particularly the testimony of Sappho at the height of the tradition—vividly confirm the historicity of the Lesbian school, and by extension that

²⁶ Ister *FGrH* 334F56 = schol. a *ad Ar. Nub.* 971: ὁ δὲ Ἀριστοκλείδης κιθαρωδὸς ἦν ἄριστος. τὸ γένος ἦν ἀπὸ Τερπάνδρου, ἤκμασε δ’ ἐν τῇ Ἑλλάδι κατὰ τὰ Μηδικά; there is some divergence between scholia α and β, including the orthography of the name, which is also given as Aristocleides. For Phrynis as heir to the Lesbian γένος, cf. also *Phaen.* fr. 10: τῶν δὲ Τερπάνδρου καὶ Φρύνιδος νόμων; ps.-Plut. *de Mus.* 1133b-c ἡ μὲν κατὰ Τερπανδρον κιθαρωδία καὶ μέχρι τῆς Φρύνιδος ἡλικίας . . . διετέλει. Cf. West (1992), 347.

²⁷ Arist. fr. 545 (Rose), cited below; cf. Phot. *Lex.* s.v. μετὰ Λέσβιον ᾠδόν: παροιμία λεγομένη ἐπὶ τῶν τὰ δεύτερα φερομένων· οἱ γὰρ Λακεδαιμόνιοι τοὺς Λεσβίους κιθαρωδοὺς πρῶτους προσεκαλοῦντο.

²⁸ Cratin. fr. 263 K-A = Phot. *Lex.* s.v. μετὰ Λέσβιον ᾠδόν. Such musical jokes are common in the comic poets who were, after all, very interested in the topic: see e.g. *Ar. Nub.* 964-972, *Thesm.* 99f., *Pherec.* fr. 155 K-A = ps.-Plut. *de Mus.* 1141d-1142a; etc.

²⁹ Sapph. fr. 106 (Voigt).

³⁰ Arist. fr. 545 (Rose) = Eustath. *ad Il.* 9.129: καὶ Ἀριστοτέλης δὲ ἐν τῇ Λακεδαιμονίων πολιτείᾳ τὸ ‘μετὰ Λέσβιον ᾠδόν’ τὸν Τερπανδρὸν φησι δηλοῦν. ἐκαλοῦντο δέ, φασί, καὶ ὕστερον εἰς τὴν ἐκείνου τιμὴν πρῶτον μὲν ἀπόγονοι αὐτοῦ, εἴτα εἴ τις ἄλλος παρεῖη Λέσβιος. εἴθ’ οὕτως οἱ λοιποὶ (“And Aristotle says in the ‘Constitution of Sparta’ says that the expression ‘After the Lesbian singer’ signified Terpander. But they say that afterwards, in his honor, his inheritors would be called first [*sc.* to perform], and then any other Lesbian who was on hand, and then the rest”); cf. Ael. Dion. ap. Eustath. *ad Il.* 9.129: see Erbse (1950), 127 λ 7 Λέσβιον ᾠδόν; Plut. *De sera num. vind.* 558a; Zen. 5.9 (1.118 Leutsch/Schneidewin); Hsch. s.v. Λέσβιος ᾠδός and μετὰ Λέσβιον ᾠδόν.

of the early musical traditions generally. We should therefore take seriously a notice which may derive from Aristotle, and certainly goes back to the fourth century, according to which the Lesbian γένος and their stringed instruments had strong ‘Asian’ affinities:

Δοῦριν δὲ Ἀριστοκλῆς φησὶ λέγειν, ὅτι ἐκλήθη [ἡ κιθάρα] Ἀσιὰς ἀπὸ τῶν χρωμένων Λεσβίων, οἵτινες οἰκοῦσι πρὸς τῇ Ἀσίᾳ. οἱ δὲ ἀπὸ Τυρρήνου Λυδοῦ, εὐρόντος πρώτου τὸ τρίγωνον ὄργανον· οἱ δὲ ἀπὸ Τερπάνδρου.³¹

Aristocles reports the assertion of Duris that the *cithara* was called Asiatic because of its use by the Lesbians, whose homes face towards Asia. Others [*sc.* say that it was so-called] from Tyrrhenus the Lydian, the inventor of the triangular harp. Still others say [*sc.* it was called Asiatic] from Terpander.

- 2.14 Strabo, one authority who preserves the fragment of Terpander, reports the conviction of some that much of Greek music derived from ‘Asia’.³² But what exactly is meant by Asia in these traditions? Strabo intended the Near East as a whole. For Herodotus, too, the word designated the whole continent: Ionia, Lydia, Phrygia,

³¹ Duris of Samos *FGrH* 76F81 = Arist. *FHG* 2 p. 182 fr. 259. The reading of the MSS (Δοῦριν . . . Ἀριστοτέλης) cannot stand, since Duris (c. 340-260) was significantly younger than Aristotle. Hullemann proposed to invert the names to Δοῦρις . . . Ἀριστοτέλην (see Jacoby’s apparatus); this resolves the chronological problem and is possible. But Duris is perhaps more likely than Aristotle to have advanced an explanation of the Asiatic *cithara*, being from Samos (where he was tyrant) and writing on local history (the Σαμίων ὥροι, *FGrH* 76F22-26); two of his other fragments are concerned with the origins of musical instruments: 76F16 (= Ath. 14.618c), 76F28 (= Ath. 14.636f). Müller’s solution, to suppose that another name, perhaps Aristocles, has been assimilated to that of the great Aristotle, involves the simpler emendation. This conjecture is very attractive: Aristocles was both a Peripatetic (being perhaps the teacher of Alexander of Aphrodisias) and wrote on musical instruments; there are besides parallels for his name being corrupted to that of Aristotle (see Müller’s notes *ad loc.*). The same source is drawn on in Ps.-Plut. *de Mus.* 6.1133c: ἐκλήθη δ’ Ἀσιὰς διὰ τὸ κεχρῆσθαι τοὺς Λεσβίους αὐτῇ κιθαρῳδοῦς πρὸς τῇ Ἀσίᾳ κατοικοῦντας.

³² Str. 10.3.17: οἱ τῷ Διονύσῳ τὴν Ἀσίαν ὅλην καθιερώσαντες μέχρι τῆς Ἰνδικῆς ἐκεῖθεν καὶ τὴν πολλὴν μουσικὴν μεταφέρουσι (“And those who have made all Asia as far as India sacred to Dionysus also attribute the better part of music to there”).

Cappadocia, Cilicia, Armenia, Persia, and so on.³³ Therefore, while the coast of Asia Minor is clearly suggested from a Lesbian perspective, the point of πρὸς τῇ Ἀσίᾳ may well be that this island was more closely involved in the ‘Oriental’ sphere, as a whole, than mainland Greece. Thus a number of sources speak of the ‘Asiatic’ *cithara* with no further qualification.³⁴ Note that the Lydian derivation is not attributed to Duris, but is presented as an *alternative* to the Lesbian and Terpandrian origins.

- 2.15 And yet there is also a persistent tradition about musical contact with Lydia, particularly as regards chordophones. No less an authority than Pindar held that Terpander invented the βάρβιτος after hearing a πηκτίς at the “feasts of the Lydians”, and similar reports surface elsewhere.³⁵ For the Greeks of the late seventh, sixth, and fifth centuries, the Lydians, and in time the Persians, were very present in the daily imagination. Their lands could be seen from Greek lands, and on the Ionian coast Greeks lived in prolonged contact with them; intermarriage was not infrequent. Contact with the Lydian capital of Sardis intensified steadily in the sixth century, with many prominent aristocrats following the example of Terpander himself (if we may trust Pindar) to make the three-day trek from the coast.³⁶ Alcman, if he was not

³³ Hdt. 5.49.

³⁴ Ar. *Thesm.* 120: κρούματά τ’ Ἀσιάδος [sc. κιθάρας], which was a parody of a lost Euripidean passage according to *Et. Magn.* s.v. Ἀσιάδος κρούματα; cf. the anonymous fragment recorded by Str. 10.3.17: κιθάραν Ἀσιᾶτιν ῥάσσων (“striking the Asiatic *cithara*”).

³⁵ Pi. fr. 125 (S-M) = Ath. 14.635d. The βάρβιτος πολύχορδος—so Theoc. 16.45—was a low-pitched lyre; the πηκτίς or πακτίς is somewhat obscure, but may have been a harp (not lyre), certainly with many strings (probably with octave couplings): see West (1992), 56-9, 71ff.. Cf. also schol. ad A. R. 2.777-9: ἡ κιθάρα Ἀσία λέγεται, ἐπεὶ ἐν Λυδίᾳ πρῶτον εὐρέθη; *Et. Magn.* s.v. Ἀσιάτις: ἡ τρίχορδος κιθάρα οὕτω καλεῖται. εἴρηται δὲ, ὅτι ἐν Ἀσίᾳ τῇ πόλει τῆς Λυδίας κειμένη ἐν Τμώλῳ πρῶτον εὐρέθη; with this one might compare Ps.-Plut. *de Mus.* 1137a-b, where the music of Terpander and Olympus is described as “simple and three-pitched (τρίχορδα . . . καὶ ἀπλᾶ): cf. 3.5; or the schematization of the heptachord by its three boundaries ὑπάτη, μέση, νήτη: see 9.39. But perhaps τρίχορδος has simply become confused with τρίγωνον.

³⁶ Hdt. 1.29.

actually Lydian himself, as Aristotle thought, no doubt made this journey.³⁷ Aristophanes implies that familiarity with Sardis was an indispensable sign of sophistication;³⁸ this is comic hyperbole, but had once been truer than it was in the playwright's day. Indeed, by the end of the seventh century, 'Asia' must have become all but synonymous with Lydia—an equation explicitly made by a scholiast to Apollonius of Rhodes.³⁹

- 2.16 Yet Phrygia and Lydia are not Mesopotamia. We know little about their musical traditions, but, if the alphabet may be taken as a parallel, it would be difficult to see the Mesopotamian musical system arriving in Greece from that direction. The Hittites may have used the cuneiform script, but these younger Anatolian nations learned the Phoenician alphabet after—and probably from—the Greeks.⁴⁰ Still, 'Asian' musical references need not be pressed too closely for geographical precision. The steady intensification of contact with Lydia and Persia will have obscured earlier, alternative routes for the arrival of Mesopotamian learning which predominated in the eighth and early seventh centuries, redrawing them on a later political and cultural map. These paths led to destinations which, being seen in person mostly by merchantmen, would never have been as tangible to the Aegean Greeks as the Lydian and Phrygian cities would be. This bifurcation may be reflected in Duris' conflicting etymologies of 'Asiatic', and is well illustrated by the fact that the earliest known Greek example of the harp (τρίγωνον ὄργανον), from the end of the seventh century, has much clearer affinities with Mesopotamian models than those of Lydia, to which Greek tradition attributed it.⁴¹ At any rate, Lydia will have been caught up in the same Orientalizing movement which swept Greece and Etruria, since their ascent to power began at the height of Assyrian imperialism.

³⁷ See *PMGF test. ad Alc.* TA1-9: *POxy* 2389 fr. 6 col. 1.10ff., fr. 9 col. 1.5ff.; *POxy.* 2506 fr. 1 col. 2, fr. 5 col. 1 (b) 3-5, fr. 17.5-8; *POxy* 3542 col. 1.17ff.; *Anth. Pal.* 7.18 (Antipater Thessalonicensis); *Anth. Pal.* 7.19 (Leonidas Tarentinus); *Anth. Pal.* 7.709 (Alexander); *Vell.* 1.18.3. Also: anon. εἰς τοὺς ἐννέα λυρικούς ap. schol. *Pi.* (1.11 Drachmann) = *PMGF test. ad novem lyricos pertinentia* TA3; *Heracl. Lemb. Exc. polit.* 9 (Dilts); *Suda* s.v. Ἀλκμάν.

³⁸ *Ar. Vesp.* 1139f.

³⁹ *Schol. ad A. R.* 2.777-9.

⁴⁰ Powell (1991), 11 n.16, 16, with further literature.

⁴¹ See West (1997), 31.

- 2.17 This is not to downplay the reality of Greco-Lybian musical contact, for this interaction must have been an important component of musical change in the Archaic period. The point is merely that simple geographical designations cannot be pressed too closely for accuracy, since cultural relations in the Aegean, and the Mediterranean as a whole, were not simply linear but a complex network. It is illuminating to consider that Assyrian records labeled all Greek-speakers 'Ionian', although Ionia, as the Greeks understood it, was not adjacent to Assyrian-controlled territory, and was certainly not the only region from which Hellenic merchants came to the Levant. Yet despite the discontinuity of the Ionian coast itself to Assyrian-controlled lands, the Ionian poetic tradition clearly reveals elements of Mesopotamian epic and theogonic poetry. Included in this geographical milieu will have been Terpander's home on Lesbos, for 'Ionia' must be understood as the stretch of islands from Euboea to Asia minor; the Ionian coast itself can make no exclusive claim to being the birth place of 'Homeric' epic.⁴² The longterm musical symbiosis of the two races is proven by the ancient Aeolic stratum which underlies the Ionic epic—with its characteristic Lesbian forms⁴³—and conversely the post-Homeric reimportation, by Sappho and Alcaeus, of Ionic epic forms (not to mention the more general Ionic influence on Lesbian dialect⁴⁴).
- 2.18 Likewise, the Greeks used 'Phoenician' to refer generically to any Near Eastern peoples who voyaged to the Aegean.⁴⁵ Thus the Phoenician hero Cadmus, whose name is simply the Semitic for "Easterner" ($\sqrt{\text{qdm}}$),⁴⁶ is in effect simply an abstraction of Near Eastern cultural contact. Herodotus reports that the Cadmeans "introduced many other forms of learning to the Greeks, as well as the alphabet"—known as "Phoenician letters" (φοινικία γράμματα) or "Cadmean letters" (Καδμήια γράμματα).⁴⁷ The historian also held that, of all the Greeks, the Ionians—using the name now as the Greeks understood it—had the closest contact

42 West (1988), 170.

43 West (1988), 163f.

44 Chadwick (1956), 46f.

45 Morris (1992), 124-7.

46 Astour (1967); 152ff.; but note that Edwards (1979), 144ff., who supports Astour's derivation, refutes him in many details regarding the Semitic background of the Cadmus mythology.

47 Hdt. 5.58-9: ἄλλα τε πολλὰ . . . ἐσήγαγον διδασκάλια ἐς τοὺς Ἕλληνας καὶ δὴ καὶ γράμματα κ.τ.λ.

with these Easterners.⁴⁸ The picture painted by the historian is less than precise, for the Greeks believed Cadmus to have lived before the Trojan War, whereas the alphabet was introduced in the ninth century or later.⁴⁹ And though Herodotus promised an Assyrian History (Ἀσσύριοι λόγοι),⁵⁰ his numerous references elsewhere do not suggest any awareness of the cultural impact that Assyria had on the Mediterranean as a whole in the ninth and eighth centuries. Only Assyrian records of ‘Ionian’ contacts corroborate the abundant ceramic and other archaeological evidence, and the extensive poetic parallels. Nevertheless, the ‘Phoenecian’ διδασκαλῖαι of Herodotus are a clear symbol of the westward movement, from a variety of sources, of Orientalizing culture generally. Thus, according to an important Pythagorean tradition preserved by Nicomachus as part of a larger catalogue of heptachordal mythology (cf. 4.28), the seven-stringed lyre was mistakenly attributed to Terpander, being rather a gift from Cadmus to the ‘Achaeans’:

Τέρπανδρος μὲν οὕτω λέγεται τὴν λύραν εὐρηκέναι, Ἀχαιοὺς δὲ ὑπὸ Κάδμῳ
τοῦ Ἀγήνορος παραλαβεῖν.⁵¹

So Terpander is said to have invented the [sc. seven-stringed] lyre, though the Achaeans received it by the grace of Cadmus [ὑπὸ Κάδμῳ], the son of Agenor.

- 2.19 The marriage of Cadmus and Harmonia, the one a symbol of Near Eastern learning, the other a key element of Greek cosmology from Heraclitus onwards (and probably much earlier: cf. 4.23)—as well as the first principle of the technology of the lyre, known since Mycenaean times and essential to the establishment of resonance (cf. 4.14-18, 4.36)—effectively documents the influx to Greece of both musical and cosmological ideas. (Incidentally, a stringed instrument called the φοῖνιξ, φοινίκιον, or λυροφοῖνιξ is well-attested, beginning with the Lesbian citharode Alcaeus.⁵²) The

⁴⁸ Hdt. 5.58: περιοίκεον δὲ σφεας τὰ πολλὰ τῶν χώρων τοῦτον τὸν χρόνον Ἑλλήνων Ἴονες (“And of the Greeks it was the Ionians who dwelt about them in most of the areas during this time”).

⁴⁹ See generally Edwards (1979).

⁵⁰ Hdt. 1.184.

⁵¹ Nicom. *Exc.* 1 (266.15f.).

⁵² Alc. fr. 424a (Campbell); Hdt. 4.192; S. fr. 239a *TrGF*; Aristox. fr. 97; ps.-Arist. *Pr.* 19.14; Ath. 14.637a-b = Nicomedes Acanthius *FHG* 4 p. 465 fr. 2; Ephor. *FGrH* 70F4; Scam. *FGrH* 476F4; Juba *FGrH* 275F15; Poll. 4.59; Hsch. s.v. λυροφοῖνιξ; *Et. Magn.*

divine music of Apollo at Harmonia's wedding—the only mortal nuptials besides that of Peleus and Thetis to be attended by the gods, and taking place in Thebes with its seven 'harmonic' gates joined by the power of Amphion's seven-stringed lyre (cf. 4.21, 4.39-30)—is one of the more notable details of an otherwise evasive myth.⁵³ Thus in one representation of their wedding procession, Apollo—the harmonic god *par excellence* (cf. 4.15)—leads the couple in a bull- and tiger-drawn chariot to the music of his seven-stringed lyre.⁵⁴ Further, the Hesiodic representation of Harmonia as the union of Ares and Aphrodite⁵⁵ might recall Astarte and Ishtar, who united love and war in a single mythological figure. The marriage of Cadmus and Harmonia would then imply the same fusion of Orientalizing music and cosmological speculation that is symbolized by Cinyras; and in fact Harmonia is said by the mysterious Derveni papyrus to be an avatar of Aphrodite Ourania,⁵⁶ whose historical derivation from the Phoenecian and Assyrian divinity Herodotus learned by inquiry.⁵⁷

797.21f.; Isid. *Etym.* 3.22.3; cf. West (1992), 59; but for the derivation from φοῖνιξ (palm-tree), Semus *FHG* 4 p. 492 fr. 1.

⁵³ [Hes.] *Sc.* 269-284 may refer to the story, given the allusion to seven-gated Thebes (cf. 4.23); Thgn. 15-18 (see below); Pi. *P.* 3.88-91; fr. 32 (S-M): (Κάδμος ἤκουσε τοῦ Ἀπόλλωνος) μουσικὰν ὀρθὰν ἐπιδεικνυμένου (cf. Plut. *De anim. procr.* 1030a; Hp. *Vict.* 1.8: ἀρμονίης ὀρθῆς of the diatonic: see further below); D. S. 5.49.1, where it is also said that Hermes' gift is a lyre.

⁵⁴ Louvre CA 1961 (F384^{bis}).

⁵⁵ Hes. *Th.* 933-937.

⁵⁶ *PDerv.* col. 21.5ff., new numbering as against Anonymous (1982), after 300ff.: see Laks/Most (1997), 9; Janko (1997), 62: Ἀφροδίτη οὐρανία καὶ Ζεὺς καὶ ἀφροδισιάζειν καὶ θόρνυσθαι καὶ Πειθῶ καὶ Ἀρμονία τῷ αὐτῷ θεῷ ὄνομα κεῖται ("Aphrodite Ourania' and 'Zeus' and 'to love' and 'to sire' and 'Peitho' and 'Harmonia'—the name is given to the selfsame god"); cf. Hes. *Th.* 975: θυγάτηρ χρυσέης Ἀφροδίτης; A. *Supp.* 1041: δέδοται δ' Ἀρμονία μοῖρ' Ἀφροδίτας (or with West: δέδοται θ' Ἀρμονίας μοῖρ' Ἀφροδίτᾳ); Emp. fr. 31B17.20-24 D-K; E. *Ph.* 7: [Κάδμος] ὃς παῖδα γήμας Κύπριδος Ἀρμονίαν; Arist. fr. 47 = ps.-Plut. *de Mus.* 1139b: ἡ δὲ ἀρμονία ἐστὶν οὐρανία τὴν φύσιν ἔχουσα θεῖαν καὶ καλὴν καὶ δαιμονίαν; Call. fr. 654; Theo Sm. 12.19f.: αὕτη ἐν κόσμῳ μὲν ἀρμονία. Paus. 9.16.3-4 found at Thebes three ancient wooden statues believed locally to have been devoted by Harmonia to three avatars of Aphrodite, which she named Ourania, Pandemos, and Apostrophia.

⁵⁷ Hdt. 1.105: ἐστὶ δὲ τοῦτο τὸ ἱρὸν [*sc.* τῆς οὐρανίης Ἀφροδίτης ἐν Ἀσκάλῳ πόλιν]. ὥς ἐγὼ πυνθανόμενος εὕρισκω, πάντων ἀρχαιότατον ἱρῶν, ὅσα

These myths reveal once again an ancient, pre-Pythagorean layer of the speculative musicology later represented by Nicomachus, Plato, Philolaus, and Pythagoras himself—in all of whom, and in the Pythagorean tradition generally, it is only the diatonic scale that is considered in cosmological contexts. Given the Mesopotamian tendency to find godlike powers in all natural phenomena, it would not be surprising if there existed a sort of divinatory art, a ‘symphonioscopy’, which explored the physical and metaphysical implications of resonance, alongside the heptatonic τέχνη.

- 2.20 Indeed, Terpander’s ἐπτάτονος tells an important tale of its own, for the term τόνος, with eight distinct layers of meaning, has clear diatonic overtones.⁵⁸ At its most basic, τόνος designated merely a stretched string of any pitch, and was synonymous with τάσις; to this category belong its various uses in rhetorical contexts, of the voice’s “pitch”. But naturally the Greeks tuned their instruments to purposeful τόνοι, and not randomly, whence the secondary equation of the term with φθόγγος, the musical “note”. Cleonides quotes the Terpander fragment as an illustration of this sense.⁵⁹ If this is right, the term ἐπτάτονος should therefore imply a specific set or means of relating seven φθόγγοι.

ταύτης τῆς θεοῦ· καὶ γὰρ τὸ ἐν Κύπρῳ ἱρὸν ἐνθεῦτεν ἐγένετο, ὥς αὐτοὶ Κύπριοι λέγουσι, καὶ τὸ ἐν Κυθήροισι Φοίνικες εἰσι οἱ ἰδρυσάμενοι ἐκ ταύτης τῆς Συρίας ἐόντες; cf. Ph. Byb. *FGrH* 790F2: τὴν δὲ Ἀστάρτην Φοίνικες τὴν Ἀφροδίτην εἶναι λέγουσιν.

⁵⁸ The musical writers vary in the number of meanings they report: see for example Cleonid. 12 (202.6ff.); Aristid. Quint. 1.10 (20.1ff.); Porph. *in Harm.* 4 (82.1ff.); Theo Sm. 70.7ff. From these and other sources I have compiled the following: 1. τάσις; 2. φθόγγος; 3. διάστημα generally; 4. the διάστημα of a whole tone specifically; 5. τόνος as a whole tuning; 6. the specific tuning of the diatonic; for 5 and 6 see below; 7. τόνος as octave species (deriving perhaps from 5 and 6); 8. τόνος as pitch key, to which we may refer Cleonid. 1 (180.4f.): τόνος δὲ ἐστὶ τόπος τις τῆς φωνῆς δεκτικὸς συστήματος ἀπλατῆς (“and τόνος is some place in pitch, without width, which can receive a system”; Aristox. *Harm.* 37: πέμπτον δ’ ἐστὶ τῶν μερῶν τὸ περὶ τοὺς τόνους ἐφ’ ὧν τιθέμενα τὰ συστήματα μελωδεῖται (“The fifth subtopic [of ἀρμονική] is that which concerns the τόνοι, upon which the systems which are sung are placed”); cf. Porph. *in Harm.* 4 (82.3ff.). For meanings 7 and 8, see further 7.5. τόνος, ἀρμονία, and Akkadian *pitnu* thus all have the same range of meaning more or less exactly: see 6.5-7.

⁵⁹ Cleonid. 12 (202.8ff.): ἐπὶ μὲν οὖν τοῦ φθόγγου χρῶνται τῷ ὀνόματι οἱ λέγοντες ἐπτάτονον τὴν φόρμιγγα καθάπερ Τέρπανδρος καὶ Ἴων. For Ion of Chios fr. 32 (West), see further 7.54-55.

2.21 Where there are purposeful pitches, there are also purposeful intervals; accordingly, some sources record a tertiary meaning of *τόνος* as the interval or “stretch” between two tuned strings.⁶⁰ Cleonides, whose third semantic level is merely *ὡς διάστημα* (“as an interval”), may also be taken to mean this, but as the sequel shows, it was usual to understand *τόνος* as the specific interval of a wholetone—in the words of Aristoxenus, “that by which a perfect fifth is greater than a perfect fourth”.⁶¹ This fourth layer of meaning must point to a time when the wholetone was the interval which typically occurred between two strings; and this clearly requires the diatonic method. It is true that a diatonic pitchset also contains in the end a semitone, so that not every interval in a diatonic scale can be a *τόνος* in this sense. But since wholetones far outnumber semitones, it was possible to understand these tone structures as proceeding “through tones” (*dia-ton-ically*), and the *γένος* is in fact so defined in a persistent tradition of probably pre-Aristoxenean pedigree.⁶² Thus Plato

⁶⁰ Aristid. Quint. 1.10 (20.1-4): *τόνον . . . καλοῦμεν . . . μέγεθος ποιὸν φωνῆς, οἷον ὥ τὸ διὰ πέντε τοῦ διὰ τεσσάρων ὑπερέχει* (“We call a *τόνος* a certain interval [lit. “size”] of the voice, as for example that by which the fifth is greater than the fourth”); schol. *ad* Ptol. *Harm.* 1.4 (10.3): *τόνος λέγεται καὶ τὸ ἀπὸ τόνου εἰς τόνον διάστημα*; Porph. *in Harm.* 82: *τόνος γὰρ λέγεται καὶ τὸ διάστημα, οἷον μέτρον τι τοῦ τῆς φωνῆς τόπου, καθ’ ὃ λέγεται μείζον εἶναι τὸ διὰ πέντε τοῦ διὰ τεσσάρων <τόνου> λόγῳ.*

⁶¹ Aristox. *Harm.* 46: *τόνος δ’ ἐστὶν ὥ τὸ διὰ πέντε τοῦ διὰ τεσσάρων μείζον, εἰ αὖτε*.

⁶² Adrastus ap. Theo Sm. 54.12-15: *καλεῖται δὲ τὸ τοιοῦτον γένος τῆς μελωδίας διάτονον . . . ὅτι διὰ τῶν τόνων τὸ πλεῖστον διοδεύει* (“This type of melody is called diatonic . . . because it progresses for the most part through tones (*διὰ τῶν τόνων*)”); Nicom. *Ench.* 12 (262.14ff.): *καὶ ἐκ τούτου γε διατονικὸν καλεῖται, ἐκ τοῦ προχωρεῖν διὰ τῶν τόνων κ.τ.λ.*; [Aristid. Quint.] 2.19 (92.22f.): *διάτονον δὲ καλεῖται διότι πεπύκνωται τοῖς τόνοις κατὰ τὰ διαστήματα* (“It is called ‘diatonic’ because it is packed with tones in its intervals”)—Meibom was the first to recognize this passage as an interpolation; it is closely followed in this and other details by Anon. Bell., here 2.26 (7.14-16): *διάτονον μὲν οὖν λέγεται, ἐπειδὴ κατὰ τὸ πλεῖον διὰ τῶν τόνων θεωρεῖται τὸ διάστημα* (“it is called ‘diatonic’ since for the most part the interval is observed through ‘tones’ [*διὰ τῶν τόνων*]”); Mart. Cap. 9.956: *diatono vero [sc. dicitur], quod tonis copiosum*; Boeth. *De inst. mus.* 1.21 (213.7): *ideoque vocatur diatonum, quasi quod per tonum ac per tonum progrediatur*. On the antiquity of this tradition, see 7.32-37.

uses τόνος to describe each and every “tone” in the cosmic, Siren-sung diatonic scale in the Myth of Er.⁶³

- 2.22 Thus, a ‘heptatonic’ lyre should mean precisely a ‘diatonic’ lyre; for the history of the term τόνος, with all its layers, points unambiguously to the word’s deep involvement with the diatonic tuning method. Terpander’s ἐπτάτονος is meaning-laden, i.e. significant, and consequently implies a particular style of music. In fact, Terpander was not merely an organological innovator. He was remembered for καινοτομία generally—his radical, trail-blazing changes to musical idiom.⁶⁴ If it is right to associate these changes with diatony, it need not be literally true that Terpander’s *phorminx* had seven strings, although this *is* the standard representation during the Archaic period. The actual tunings used in the new music would *always* be ἐπτάτονος, regardless of the instrument used to render them—though a minimum of seven strings would be needed (cf. 4.27, 10.2-10). In Mesopotamia, the ‘heptatonic’ system was expressed in terms of the nine-stringed *sammû* (cf. 6.3). Thus, according to one tradition, the salient fact is that Terpander “invented the heptatonic *tuning*” (τὴν ἐπτάτονον ἁρμονίαν εὐρεῖν).⁶⁵
- 2.23 This subtle distinction, between the seven-stringed lyre and ἡ ἐπτάτονος ἁρμονία, is effectively glossed in the *Hymn to Hermes*, the standard mythological account of the instrument’s invention, dating to the sixth century or earlier—though naturally the

⁶³ Pl. *Resp.* 10.617b: Σειρήνα συμπεριφερομένην, φωνὴν μίαν λείσας, ἓνα τόνον; cf. Philostr. *Im.* 1.10.15.

⁶⁴ Ps.-Plut. *de Mus.* 1135c: ἡ Τερπάνδρου καινοτομία; cf. Jacoby’s restoration to *Marm. Par. FGrH* 239A34: Τέρπανδρος . . . τοὺς νόμους τοῦ[ς] κιθ[α]ρ[ω]ιδ[ι]κ[ο]ύς . . . [ἐκαινοτόμ]ησε καὶ τὴν ἔμπροσθε μουσικὴν μετέστησεν. Where νέος refers to that which is predictably new through the passage of time, like leaves in Spring, καινός refers to novelty which has no precedent and represents a break with the past. It may be formed from the stem of καίειν, “to burn”, and so correspond to our expression “brand new”: see D’Angour (1998), 21-26.

⁶⁵ Georg. Syncell. *Chronog.* 403 (253.21 Mosshammer). Note that ἁρμονία may well be anachronistic here, not being certainly attested in the sense “tuning, scale” before Lasus of Hermione (fr. 1 *PMG* 702) in the late sixth century; but see further 4.14.

myth itself may well be older than our text.⁶⁶ The concluding lines of a technical set-piece read:

καὶ πήχεις ἐνέθηκ', ἐπὶ δὲ ζυγὸν ἤραρεν ἀμφοῖν,
ἐπτά δὲ συμφώνους ὁτῶν ἐτανύσσατο χορδὰς.⁶⁷

And he put in the arms, and joined a yoke upon them both,
And stretched seven consonant strings of sheepgut.

2.24 This is the first appearance of the word σύμφωνος (“consonant”) in Greek literature. So much earlier is it than the next attestations that some scholars would deny any specific technical relevance to Hermes’ σύμφωνοι χορδαί (“consonant strings”).⁶⁸ And yet Apollo, hearing the new sound, explicitly inquires of his brother “What is this τέχνη?”.⁶⁹ We must not fail to give the word its due weight. In Stravinsky’s admirable definition, τέχνη is “the knowledge and study of the certain and inevitable rules of the craft”.⁷⁰ This is what Alcman described concisely as τὸ καλῶς κιθαρίσδην (“to play the *cithara* beautifully”),⁷¹ while Terpander was remembered as ἐντέχνως κιθαρίσας (“playing the *cithara* in accord with the τέχνη”).⁷² Only such a reading of the *Hymn* can explain, besides σύμφωνοι χορδαί, the presence in these verses of other details of technical relevance to ἀρμονική (cf. 4.16, 7.47-52), including a number of dactylic ‘fragments’ of a still earlier epic musical vocabulary elsewhere in the poem (cf. 5.14-19).

2.25 Far from being untechnical, this early passage is of chief importance, attesting that consonance was the key feature of the new seven-stringed instrument. “Beautiful

⁶⁶ The *Hymn to Hermes* has been variously dated, to as late as the end of the sixth century: see Janko (1982), 143; he is, however, receptive to a date as early as the second half of the seventh century, but not earlier because there is false archaism (communication).

⁶⁷ *H. Merc.* 50f. The key defense of the reading συμφώνους over the variant θηλυτέρων is that Sophocles *Ichn.* 326 (Maltese) used σύμφωνον in his adaptation of the myth, which is in fact one of the next attestations of the word (preceded by *Pi. P.* 1.70, followed by *Ion* of Chios fr. 32 (West) and *Ar. Av.* 221, 659). See further 5.9.

⁶⁸ Barker (1982-9) 1.43 n.18, cf. 1.295 n.177.

⁶⁹ *H. Merc.* 447, cf. 482ff.

⁷⁰ Stravinsky (1942), Lesson 1.

⁷¹ *Alcm.* 41 *PMGF.*

⁷² *D. S.* 8.28 ap. *Tz. H.* 1.389.

musicianship”, τὸ καλῶς κιθαρίσδεν, required each string “to be well and knowledgeably tuned” (τὸ “εὖ καὶ ἐπισταμένως” εἶναι τὴν νευράν), the most basic musical definition of ἀρμονία.⁷³ According to the Hippocratic *De victu*, the “beautifully tuned voice” comes through the use of consonance (καλῶς δὲ ἡρμοσμένης γλώσσης τῇ συμφωνίᾳ)—and here the diatonic is assumed.⁷⁴ Indeed, with every string described as σύμφωνος in the *Hymn to Hermes*—σύμφωνοι χορδαί—it is natural to understand consonance as operating mutually throughout. The tuning is consonant *as a whole*, with the seven resonating strings which are the prerequisite of diatony. Thus συμφωνία or συμφωνεῖν could be used collectively to describe a tuning, where the diatonic is often assumed.⁷⁵ After all, the enharmonic and chromatic genera used a number of relations which could *not* be established by the process of consonant tuning, ἡ λῆψις διὰ συμφωνίας.⁷⁶

- 2.26 Diatony was thus the heptatony *par excellence*. For Terpander, ἐπτάτονος may well have been synonymous with the later διάτονος. First attested only in Aristoxenus, this term must owe its existence to the need for distinguishing between several types of scales—heptatonic scales—some of which did not proceed “through tones”, were not “tuned throughout” or “cross-supported”, or whatever διάτονος originally meant in this context—for τόνος and διάτονος, like ἀρμονία and Akkadian *pitnu*, all belong to a metaphor of construction (cf. 4.20-22, 6.5-7). Likewise the term σύντονον, which in and after Aristoxenus referred to the Pythagorean tuning, presupposes a different type of diatonic, the μαλακόν or “soft”. Taken together, the two terms suggest the “tense” diatonic as a norm, and σύντονον describes this tuning quite well since each τόνος—whether we understand the word as an individual pitch, or the interval between two such pitches—is “together” with its neighbors in the correct resonant—i.e. diatonic—place. Indeed, in less technical passages which use τόνος to mean

⁷³ Schol. *ad Ar. Eq.* 994 = *Suda* s.v. ἀρμονίαν; for the dactylic quotation, see 4.17, 5.16-18.

⁷⁴ Hp. *Vict.* 1.18. On the assumption of diatony here and in 1.8, see below.

⁷⁵ Pl. *Resp.* 10.617b: ἐκ πασῶν δὲ ὀκτώ οὐσῶν μίαν ἀρμονίαν συμφωνεῖν; Nicom. *Exc.* 3 (242.15f.): τῆς κοσμικῆς συμφωνίας; 6 (277.9-10): ἐπταφθόγγω . . . συμφωνία.

⁷⁶ Ps.-Plut. *de Mus.* 1145b-c, esp. τὸ μὴ δύνασθαι ληφθῆναι διὰ συμφωνίας τὸ μέγεθος, καθάπερ τό τε ἡμιτόνιον καὶ τὸν τόνον καὶ τὰ λοιπὰ δὲ τῶν τοιούτων διαστημάτων (“the magnitude [*sc.* of a quarter-tone] cannot be taken through consonance, like the semitone and tone and the other such intervals”).

“tuning”, the diatonic is often either implicit or explicit.⁷⁷ This peculiar usage, which had disappeared from the language of the theorists by the fourth century, continuing only in the sub-technical vernacular, suggests that the ‘normal’ tuning designated by *τόνος* and *ἁρμονία* was diatonic for non-professionals of basic musical education, even as professional musicians were expanding their horizons. Hence, according to Aristides Quintilianus, “[the diatonic] can be sung by everyone, even those who are altogether uneducated” (πᾶσι γὰρ καὶ τοῖς ἀπαιδεύτοις παντάπασι μελωδητόν ἐστι).⁷⁸ This is important for understanding the Archaic background of the Classical *θεωρία*, for it lets us assume, in the absence of qualifiers, that the seven-stringed lyres which are ubiquitous in vase paintings of the seventh and sixth centuries were for the most part, like Terpander’s *ἐπτάτονος φόρμιγξ*, tuned ‘normally’, i.e. diatonically. Compare the Akkadian tuning *išartu* (“upright, normal”), found at one end of the diatonic cycle (cf. 6.17, 6.21-31), with *ἁρμονίης ὀρθῆς* in the *De victu*, Apollo’s *μουσικὰν ὀρθάν* at the wedding of Cadmus and Harmonia, and “the orthian style of melody” (τὸν τῆς ὀρθίου μελωδίας τρόπον) attributed to Terpander.⁷⁹ High-pitched music is frequently described as “Orthian” elsewhere,⁸⁰ but here the word, which has both the meanings of *išartu*, seems to describe something more general. We do indeed find early hints of enharmonic and chromatic music, but these exceptions mark

⁷⁷ Ar. *Eq.* 532: τοῦ τόνου οὐκέτ’ ἐνόντος shows *τόνος* as a “tuning” generally; Hp. *Vict.* 1.8 also refers to a whole tuning as *τόνος*, and states that without *ἁρμονία* it cannot exhibit the consonances of fourth, fifth and octave; based on the linguistic parallels to Philol. fr. 44B6a D-K, this passage must assume the diatonic—which most consistently employs these consonances, as later enshrined in Aristoxenus’ rule of *συνέχεια* (cf. 7.26-39); *τόνος* is expressly equated with “diatonic tuning” at *Anth. Pal.* 16.220.5f. (Antipater), where it is contrasted with the other genera: ἄλλ’ ἃ μὲν κράντειρα τόνου πέλει, ἃ δὲ μελωδὸς / χρώματος. ἃ δὲ σοφᾶς εὐρέτις ἁρμονίας (“But the one [*sc.* Muse] is master of the diatonic, the next is a singer of the chromatic, and the last is inventor of the clever enharmonic”); three Muses, one per *γένος*, are likewise attested at Plut. *Quaest. conviv.* 744c: τρεῖς ἦδεσαν οἱ παλαιοὶ Μούσας . . . αἰτία δ’ οὐχ ὥς ἔνιοι λέγουσι τὰ μελωδούμενα γένη, τὸ διάτονον καὶ τὸ χρωματικὸν καὶ τὸ ἐναρμόνιον; for the tradition of three Muses corresponding to *ὑπάτη*, *νήτη* and *μέση*, see 9.40.

⁷⁸ Aristid. Quint. 1.9 (16.11-15).

⁷⁹ Pi. fr. 32 (S-M), cited above; Hp. *Vict.* 1.8, cited above; for the Orthian music of Terpander, see further 10.38.

⁸⁰ References to ‘Orthian’ of high-pitched music, including the so-called *ὀρθιος νόμος*, as well as ‘Orthian’ rhythm, are collected by Barker (1982-9), 1.251ff.

the rule. This diatonic background to the σύστημα τέλειον is demonstrated in detail in 7.0.

- 2.27 Terpander's ἑπτάτονος φόρμιγξ is therefore of much greater significance than at first meets the eye. Appearing in the right place at the right time, and with the needed technology of seven resonating strings, it was the instrument by which Archaic melic was achieved. Yet though the Orientalizing epoch is fairly described as a cultural revolution, we cannot believe that an imported music would simply have replaced inherited musical arts. By an accident of geography, the Greeks were close enough to the Assyrian cultural sphere to be enriched with new ideas, but had enough distance for independent growth and the survival of ancient traditions.⁸¹
- 2.28 It is clear from scattered musical references in Homer as well as geometric vase-painting that, prior to the Orientalizing period, the Greeks had enjoyed a rich and varied musical life. Ionic epic song, to which belong our only documents illustrative of this period—the Homeric poems—was but part of this tradition. Yet this is not as crippling as it may seem. For the *Iliad* and the *Odyssey*, though they too show a considerable amount of Asiatic influence, derive principally from an art of oral performance which had for centuries occupied a high station in Greek culture, descending ultimately from the Indo-European poetic tradition—of which they preserve clear traces as regards metrics, diction, and theme.⁸² The Ionic epic was one branch of this larger poetic tradition. And yet, because it was the preeminent Greek art-music immediately before the Archaic period, a diatonicizing musical movement would have meant a juxtaposition or even confrontation with this tradition, all the more since both were intimately concerned with stringed instruments. One might well imagine this situation in Terpander's exhortation to "reject four-voiced song" in

⁸¹ Cf. Burkert (1992), 29, 129: "Under the special circumstances of the eighth century, they could participate in every development at the time without falling victim to the concomitant military devastations, as did their neighbors in Syria and Southern Anatolia . . . Cultural predominance remained for a while with the Orient; but the Greeks immediately began to develop their own instinctive forms of culture through an astonishing ability both to adopt and to transform what they had received."

⁸² On the status of the Indo-European singer and for the poetics of this tradition, see Watkins (1995); for Ionic epic as heir to Indo-European praise poetry, West (1988); the Indic-Greek metrical parallel and South Slavic heroic song are discussed in the next chapter. Caesar (*B Gall.* 6.13-14) described the formal schools where Celtic bards learned traditional lore and song, Tacitus (*Germ.* 2-3) the ancient Germanic singers: see further 3.20.

favor of new songs on the heptatonic lyre. As the professional musician *par excellence*,⁸³ the traditional epic singer (αοιδός) would have been the principal agent in any new musical development. When Homer sang that “men celebrate more whatever song is newest to the audience” (τὴν γὰρ αοιδὴν μᾶλλον ἐπικλείουσ’ ἄνθρωποι, ἢ τις ἀκουόντεσσι νεωτάτη ἀμφιπέληται), he was proclaiming the vibrancy of his own tradition and his authority to sing anew within it.⁸⁴ But the statement reveals a dynamic musical culture which would crave novel forms of expression when the Ionian epic had begun to wane; as Timotheus would sing centuries later, “I do not sing the old . . . Away with the Old Muse” (οὐκ αἶδω τὰ παλαιά . . . ἀπίτω Μοῦσα παλαιά).⁸⁵

- 2.29 In such a situation it is better to speak of the coexistence and eventual interaction of styles. For the fundamental Indo-European basis of Archaic Greek metrical composition is enough to prove the unbroken line of native Greek musical development during and beyond the Orientalizing period. This tradition’s encounter with the Oriental heptatonic art is best understood as a case of musical syncretism, similar to those which have been subject much recent ethnomusicological research.⁸⁶ At its height, the Orientalizing musical movement may have seen the relatively faithful pursuit of ‘Asian’ music as fashionable exotica, alongside epic performances. According to ps.-Plutarch, citharodes of the traditional Terpandrian style down until the time of Phrynis, “after making whatever musical offerings to the gods they wished, proceeded immediately to the poetry of Homer or others” (τὰ γὰρ πρὸς τοὺς θεοὺς ὡς βούλονται ἀφοσιωσάμενοι, ἐξέβαινον εὐθύς ἐπὶ τε τὴν Ὀμήρου καὶ τῶν ἄλλων ποιήσιν).⁸⁷ In support of this he cites the “preludes of Terpander” (τῶν Τερπάνδρου προοιμίων), and in fact one of the Terpandrian fragments is clearly of this type.⁸⁸ The exhortation to put aside τετράγηρυν αοιδάν in favor of new

⁸³ For the professionalism of the αοιδός, see Parry (1932), 6-9, 46ff.

⁸⁴ Hom. *Od.* 1.351f.; see Nagy (1974), 11f.

⁸⁵ Tim. fr. 20 (*PMG* 796); on Timotheus, see further 8.63.

⁸⁶ Seminal studies of this phenomenon are Waterman (1952), Nettl (1964); (1978); (1985); Merriam (1964). These scholars have elucidated the various confluences which may result from two music-streams in contact, and the social and musical conditions which are typical in each case. Further literature cited in Nettl (1985), 22f.

⁸⁷ Ps.-Plut. *de Mus.* 6.1133c.

⁸⁸ Terp. fr. 2 (Gostoli) ἀμφί μοι αὖτις ἀναχθ’ ἐκαταβόλον / αἰδέτω φρήν; cf. West (1971), 307.

heptatonic hymns could have served a similar transitional function,⁸⁹ but is of still greater value for attesting a juxtaposition of styles, and summarizing the defining tonal features of each. The later attribution of a corpus of such opening hymns to Terpander⁹⁰ shows the Lesbian singer to be a symbol of the new heptatonic music of the Archaic period—of the melic revolution.

- 2.30 Within a few generations, the two styles seem to have fused. The Homeric *Hymns* were, in terms of diction, metrics, and composition, essentially faithful to the inherited art. But since the ὕμνος was the special province of the lyre (cf. 5.22), we must assume that, as the inherited poetic τέχνη unfolded throughout the Archaic period, musicians were coming to perform now with the heptatonic instruments which are ubiquitous in contemporary vase paintings. The *Hymn to Hermes* is particularly intriguing in this light, telling of the god's invention of the seven-stringed lyre and its adoption by Apollo, the traditional god of the epic singer and his *phorminx*. In effect, the poem documents the assimilation of heptatony by the traditional αἰδός, echoing Terpander's exhortation to embrace the seven-stringed lyre in preference to "four-voiced song" (see further 5.0). Thus the Delian chorus, after singing hymns to Apollo, Leto, and Artemis, would sing another one "remembering the men and women of old" (μνησάμεναι ἀνδρῶν τε παλαιῶν ἡδὲ γυναικῶν / ὕμνον αἰδούσιν)⁹¹—i.e. the ancient ἔπη set to a melic ὕμνος. Such a mixture of epic and melic is also seen in the odes of Pindar, who repeatedly summons the seven-stringed lyre as he relates κλέα ἀνδρῶν in complex melic compositions, which he once describes as ἐπέων . . . ὕμνον.⁹² It is essentially the same fusion which underlies Attic tragedy. This brings point to Theognis' depiction of the Muses and Graces singing an ἔπος in praise of the bride's beauty at the wedding of Cadmus and Harmonia; that it spans a complete hexameter suggests a quotation from an earlier poem.⁹³

⁸⁹ West (1971), 307.

⁹⁰ West (1971), 307; cf. West (1981), 116 n.24; West (1992), 18f.

⁹¹ *H. Ap.* 160f.

⁹² *Pi. N.* 5.24f.; 9.3: ἀλλ' ἐπέων γλυκύν ὕμνον πράσσετε; *P.* 2.70f.

⁹³ *Thgn.* 15-17 (West): Μοῦσαι καὶ Χάριτες, κοῦραι Διός, αἳ ποτε Κάδμου / ἐς γάμον ἐλθοῦσαι καλὸν αἰέσατ' ἔπος / "ὅττι καλὸν φίλον ἐστί, τὸ δ' οὐ καλὸν οὐ φίλον ἐστί" / τοῦτ' ἔπος ἀθανάτων ἦλθε διὰ στομάτων ("The Muses and Graces, daughters of Zeus, who once upon a time came to the wedding of Cadmus and sang an ἔπος: 'Whatever is beautiful is ours, but what is not beautiful is not': this is the ἔπος which came from the mouths of the goddesses").

- 2.31 Though μέλος in its primary sense of “limb” appears with great frequency in Homer, the musical μέλος, meaning both “tuning” and “melody, tune”, is first attested in the Archaic period, in the poetry of Alcman and Stesichorus.⁹⁴ One must beware the limitations of the evidence, but it is tempting to connect this secondary sense with some post-Homeric musical development. μελωδεῖν would then indicate not simply the traditional singing implicit in the Homeric αἰδεῖν, but singing in accordance with novel intonational customs designated by μέλος, i.e. following an instrumental, articulated pathway. Consider Diodorus’ description of Apollo singing “a song harmonized to the tuning of the *cithara*” (ἀρμόττουσαν τῷ μέλει τῆς κιθάρας ᾠδὴν).⁹⁵ The Hippocratic *De victu* describes singing as “imitating” instrumental music:

μουσικῆς ὄργανον ὑπάρχει δεῖ πρῶτον ἐν ᾧ δηλώσει ἃ βούλεται . . . κρούεται τὰ κρούματα ἐν μουσικῇ τὰ μὲν ἄνω καὶ τὰ δὲ κάτω. γλῶσσα μουσικὴν μιμεῖται, διαγινώσκουσα μὲν τὸ γλυκὺ καὶ τὸ ὀξύ τῶν προσπιπτόντων, καὶ διάφωνα καὶ ξύμφωνα.⁹⁶

First there must be an instrument of music on which to clarify what is desired . . . The instrumental accompaniments [τὰ κρούματα] in music are played [κρούεται] now high, now low. The tongue imitates the music, recognizing the sweet [= low?] and the sharp/high as the accompaniment plays out, and the non-consonant and the consonant.

- 2.32 The word μελωδεῖν itself, which describes this process of ‘melodizing’, is not attested before the late fifth century; by contrast we find expressions like ἀοιδὲ μέλος in Alcman.⁹⁷ Conversely, poor singing was described as παρὰ μέλος, “contrary to the μέλος”, and this came to be applied metaphorically to poor judgement.⁹⁸ In such passages, the apparent ambiguity between “song” and “scale/tuning” may be unimportant, for if the melic music was in fact based upon a specific convention of tuning, the two can never be divorced. Rather, the two layers of meaning demonstrate that what the later Greeks considered ‘music’ or ‘melody’ was originally distinct

⁹⁴ Alcman. 126 *PMGF*; Stesich. 212 *PMGF*.

⁹⁵ D. S. 3.59.3.

⁹⁶ Hp. *Vict.* 1.18.

⁹⁷ Alcman. 14.a.2 *PMGF*; cf. 3 fr. 1.5: καλὸν ὕμνιοισᾶν μέλος; 35: κάλλα μελισδομέναι; 37b: ὑπαυλησεῖ μέλος; 126.1: Φρύγιον αὖλησε μέλος; Sapph. fr. 44.26 (Voigt): ἰαῖδον μέλος; Stesich. fr. 212 *PMGF* ὕμνεῖν Φρύγιον μέλος.

⁹⁸ Pi. *N.* 7.69; Pl. *Phlb.* 28b; Lg. 696d; Arist. *EN* 4.2.1123a22.

from those ‘musical’ arts governed by the Muses of Homer and Hesiod, who did not need the word μέλος to describe their songs.

- 2.33 This may help illuminate certain curious descriptions of Terpander’s καινοτομία. According to Alexander Polyhistor, the Lesbian singer fused “the epic language of Homer and the melodies of Orpheus” (Ὅμηρου μὲν τὰ ἔπη, Ὀρφέως δὲ τὰ μέλη).⁹⁹ In a notice deriving from Heraclides of Pontus, we learn that

τὸν Τέρπανδρον . . . κιθαρωδικῶν ποιητὴν ὄντα νόμων κατὰ νόμον ἕκαστον τοῖς ἔπεσιν τοῖς ἑαυτοῦ καὶ τοῖς Ὀμήρου μέλη περιτιθέντα ᾄδεν ἐν τοῖς ἀγῶσιν.¹⁰⁰

Terpander . . . a poet of citharodic *nomes*, wrapping melodies [μέλη] *nome* by *nome* [κατὰ νόμον] around his own words [ἔπη] and those of Homer, sang (ᾄδεν) them in the contests.

The indigenous ‘epic’ roots of Terpander’s music are epitomized in a tradition preserved in the *Suda*, that the Lesbian gleeman was a third-generation descendent from Homer; a Hesiodic lineage is also mooted.¹⁰¹ Plutarch describes him as a “singer of heroic deeds” (τῶν ἡρωικῶν πράξεων ἐπαινέτην).¹⁰² In fact, the fragments of Terpander—both genuine and spurious, however one divides them—are predominantly dactylic.¹⁰³ Likewise dactylic rhythms appear throughout the Archaic melic corpus in variously refracted forms, and were still used by Timotheus as a nod to tradition.

⁹⁹ Alex. Polyh. *FGH* 273F77 = ps.-Plut. *de Mus.* 1132e-f. Cf. ps.-Plut. *de Mus.* 1132d-e: πεποίηται δὲ τῷ Τερπάνδρῳ καὶ προοίμια κιθαρωδικὰ ἐν ἔπεσιν; Clem. Al. *Strom.* 1.16.78: μέλος τε αὖ πρῶτος περιέθηκε τοῖς ποιήμασι (“He was first to dress poems in ‘melody’”).

¹⁰⁰ Heraclid. Pont. fr. 157 = ps.-Plut. *de Mus.* 1132c; cf. Procl. *Chr.* 45.

¹⁰¹ *Suda* s.v. Τέρπανδρος.

¹⁰² Plut. *Inst. Lac.* 238c.

¹⁰³ Cf. ps.-Plut. *de Mus.* 1132d: πεποίηται δὲ τῷ Τερπάνδρῳ καὶ προοίμια κιθαρωδικὰ ἐν ἔπεσιν (“Citharodic preludes have been composed by Terpander in ‘epic language’”); cf. 1133c, quoted above); Procl. *Chr.* ap. Phot. *Bibl.* 320b5f.: Τέρπανδρος . . . ἡρώω μέτρῳ χρησάμενος (Terpander . . . using heroic metre”).

2.34 Indeed, the Lesbian school, which dominated the citharodic music of the early Archaic period, may have been a late reflowering of the Aeolic musical art which preceded and was adopted by the Ionian singers, of whom Homer was a last great representative.¹⁰⁴ The dactylic hexameter itself was but one specialized development of a broader and older metrical tradition, whose ultimately Indo-European roots are best seen in the ancient metres of Sappho and Alcaeus, which find close Indic and Slavic analogues.¹⁰⁵ From this broad perspective, Terpander's setting of 'Homeric' ἔπη to heptatonic music may be understood as the continuation of the inherited poetic diction as a whole, and not merely the Ionic art.¹⁰⁶ Terpander, Sappho, and Alcaeus were working in the post-Homeric musical world, of course—a relatively recent development from the perspective of Indo-European metrics, and close to home geographically. But, for all that Sappho made use of Ionic epic language, there are many vestiges of a traditional diction which cannot be traced to Homer.¹⁰⁷ Nor was the ancient preeminence of Aeolic musical tradition forgotten. Timotheus makes a point of Terpander's Aeolic descent,¹⁰⁸ and the juxtaposition with Orpheus attested here and elsewhere might represent a mythological schematization of the tradition's ultimately Mycenaean heritage—as we shall see, Nicomachus preserves a catalogue of heptachordal lore which contains a more detailed treatment of the same sequence, and seems to preserve a grain of historical truth about Mycenaean music (cf. 4.28-32, 5.10-13, 8.61-64). This ancient authority of the Aeolian musicians may explain why the Spartans summoned Terpander for the musical healing of their city.¹⁰⁹ According to

¹⁰⁴ For the Aeolic phase of Greek epic see Parry (1932), 23-47; Ruijgh (1961), 214f.; Janko (1982), 89-93, 232, *et passim*; West (1988), 159-65.

¹⁰⁵ Nagy (1974). See further 3.31.

¹⁰⁶ For ἔπος as epic diction in dactylic hexameter versus the plural ἔπεα/ἔπη of epic diction generally, see Nagy (1974), 11 n.29 with further literature.

¹⁰⁷ See Nagy (1974), 14; West (1988), 165.

¹⁰⁸ Tim. *Pers.* fr. 15.227f. (PMG 791): Λέσβος δ' Αἰολία νῖν' Αν- / τίσσαι γείνατο κλεινόν ("Aeolian Lesbos begot him to be glorious for Antissa").

¹⁰⁹ See especially D. S. 8.28 ap. Tz. *H.* 1.389ff.: καὶ δὴ τι μέλος Τέρπανδρος ἐντέχνως κιθάριας / αὐτοὺς πάλιν συνήρμοσε, Διόδωρος ὡς γράφει, / τῆς ἀρμονίας τῇ ᾠδῇ ("and indeed Terpander, skillfully playing some melody on his κιθάρα, "harmonized" them again, as Diodorus says, through the 'Song of ἀρμονία'"); cf. Dem. Phal. ap. Schol. E Q *ad Od.* 3.267 (144 Dindorf); Heracl. Lemb. *Exc. polit.* 11 (Dilts); Philodem. *Mus.* 1.30.31-35, 4.19.4-20.7 (Kemke) = Diog. Bab. fr. 84 SVF 3.232; Plut. *Agis* 799f; ps.-Plut. *de Mus.* 1146b-c; Aristid. *Or.* 3.231, 242; Ael. *VH* 12.50; Clem. Al. *Strom.* 1.16.78; Phot. *Lex.* s.v. μετὰ Λέσβιον ᾠδόν; Zen. 5.9 (1.118 Leutsch/Schneidewin): τῇ

tradition, the Delphic oracle merely bade them “summon the Lesbian singer,” as if the function of musical healing, or at least musical excellence, belonged to an ancestral ethnic office. In fact, as we have seen, the Lesbian school as a whole was accorded special privileges in Sparta, reputedly on account of the service rendered by Terpander.¹¹⁰

2.35 The syncretism which is evident on the level of genre may be at least partially reflected in the non-diatonic genera of the Classical period. These ‘deviations’ from diatonic intonation probably derive from a complex of sources: the inherited epic αοιδή (itself an ancient syncretism of Mycenaean, Aeolic, and Ionian elements) and other regional styles (cf. 3.33), perhaps tonalities proper to the αὐλός (cf. 1.24-25), and of course post-Orientalizing innovation independent of anything which had gone before in Greece or the East. Yet Aristoxenus’ rule of συνέχεια ensured that every heptatonic scale or μέλος ἡρμοσμένον, of whatever genus, was constituted according to diatonic structural principles. This close connection between the musical μέλος and συμφωνία is already attested in the *Hymn to Hermes*. That Aristoxenus makes συνέχεια the “first principle” of ἀρμονική shows that, however strongly assimilated to Hellenic practice, the diatonic system of Mesopotamia remained the foundation of an entirely new artform and persisted in dictating its broad outline for centuries (see further 7.26-39).

2.36 Alongside this central syncretism, I detect several phenomena at the margins of the Orientalizing movement. Some singers clearly resisted the temptations of melic music altogether, or at least preserved alongside it the older art in relatively pure form. As the Archaic period wore on, epic song became increasingly static and fossilized, giving rise to the latter-day rhapsodes and Homerids—repertory artists who kept alive the memory and music of the ancient epic singers.¹¹¹ Homer himself already shows signs of ossification, that the Ionic αοιδή, though still living, was a classical art which was enduring less than growing.¹¹² All the same, some ability in

μουσικῇ χρώμενος, ἥρμοσεν αὐτῶν τὰς ψυχὰς καὶ τὴν στάσιν ἔπαυσεν; Boeth. *De inst. mus.* 1.1 (185.17-20). Cf. Gostoli (1988).

¹¹⁰ Phot. *Lex.* s.v. μετὰ Λέσβιον ᾠδόν: ἀκαταστατούσης γάρ ποτε τῆς πόλεως αὐτῶν χρησμός ἐγένετο τὸν Λέσβιον ᾠδὸν μεταπέμπεσθαι (“For the Spartans used to call forth the Lesbian citharodes first; for once when their city was in turmoil, there came an oracle to ‘summon the Lesbian singer’”).

¹¹¹ The evidence for the Homerids is collected by Allen (1924), 42-50.

¹¹² Parry (1932), 40ff.

heroic song persisted down to the second century B.C., as shown by competent interpolations to the text of Homer and the latest Homeric *Hymns*.¹¹³ Of course, this does not imply equal competence in the ancestral singing itself, for the recording of texts would have artificially emphasized the dictional over the melodic aspects of the tradition. A more vibrant musical survival may have been the bucolic poetry which was recast by Theocritus in polished literary form during the Hellenistic period. Though dactylic hexameter and the elegiac couplet were widely used in Alexandrian poetry, oral composition in dactylic rhythm—Ionic hexameter being but one manifestation—was itself very ancient, and traditional forms were perhaps more likely to persist in rustic backwaters (cf. 4.5).¹¹⁴ There was also a strong tradition of non-Homeric heroic poetry in Magna Graecia, represented by Stesichorus, Ibycus, and Xenocritus,¹¹⁵ who followed the Terpandrian precedent of epic-melic. Another outgrowth of the high epic tradition may have been the musical παιδεία of the Classical period, where adaptation to changing circumstances helped preserve the traditional didactic role of the αἰδοί—described by Demetrius of Phalerum in his works on Homer as “teachers of matters human and divine” (διδασκάλους τῶν τε θείων καὶ ἀνθρωπίνων).¹¹⁶ Central to this education were the *Iliad* and *Odyssey*, swan songs of the Mycenaean-Aeolic-Ionic epic, as well as the ancestral tool of the singers’ trade—the lyre.

- 2.37 Diatonic, and more generally heptatonic, music also appears to have persisted in relatively pure form. The fourth-century *Hibeh Papyrus* implies that “diatonic music” (διατόνῳ . . . μουσικῇ) was pursued to the exclusion of the other γένη by the peoples of northern and northwestern Greece.¹¹⁷ We may suppose that the

¹¹³ On epic interpolations, see West (1997), 601f.; (1971), 114. The so-called Homeric *Hymn to Ares*, centuries younger than the other Homeric *Hymns*, is actually by Proclus: see West (1970); cf. Janko (1982), 1.

¹¹⁴ On the traditional background of Theocritean bucolic, see Dover (1971), liv-lxv; on the hexameter as vehicle of Alexandrian poetry, Hunter (1996), 4-6.

¹¹⁵ West (1971), 306, 311ff.

¹¹⁶ Cf. Dem. Phal. fr. 191 (Wehrli).

¹¹⁷ *PHib.* 13.17ff.; for text see 7.36. Though the papyrus itself belongs to the third century B.C., an early fourth-century date has been tentatively accepted for this text on the basis of rhetorical style, mention of the enharmonic as current in tragedy, and its supposed reference to wooden theatre seats, replaced with stone in the Theatre of Dionysus by the mid fourth century: see Anderson (1966), 149f.; convincingly attributed to Alcidamas by Brancacci (1988); questioned by Barker (1982-9), 1.183.

same was true in other less cosmopolitan communities outside of Athens. In Arcadia, for example, that stronghold of the ancient, children had to master music “in the ancestral style” (κατὰ τὰ πάτρια) before indulging in the post-heptachordal works of modernist professionals like Philoxenus and Timotheus¹¹⁸—precisely what Aristotle recommended for the ideal music lesson.¹¹⁹ It was this culture of traditional music which drew the young Aristoxenus to Mantinea;¹²⁰ because he exalted the art of stringed-instrument music above that of winds (cf. 1.22), one can assume that he devoted himself to a heptachordal music which he found in well-preserved, ‘Terpandrian’ form. It is no accident, then, that his cardinal rule of συνέχεια protected the heptatonic integrity of the older θεωρία that was transformed into the Perfect System. In Argos, we hear of penalties for musicians who tried to use more than the traditional seven strings,¹²¹ and Cicero reports that many Greek cities were equally resistant to musical change.¹²² In Athens itself, Damon, one of the foremost intellectuals of the time, and the friend and lyre-teacher of Pericles,¹²³ feared that the breakdown of musical convention might lead to a social revolution, “for nowhere do musical fashions change without the greatest civic customs also changing” (οὐδαμοῦ γὰρ κινοῦνται μουσικῆς τρόποι ἄνευ πολιτικῶν νόμων τῶν μεγίστων).¹²⁴ Damon’s speech to the Areopagus, urging that the state should take firm action in the regulation of music, is probably a literary fiction of the later fourth century, penned perhaps by Heraclides of Pontus.¹²⁵ But there is no doubt that the New Music, a prominent element of more general social upheaval in Athens and elsewhere, caused real concern for Damon’s generation. One wonders, incidentally, what other great musical change he knew of in formulating his law of sociomusical revolution, if the heptachordal music

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- ¹¹⁸ Plyb. 4.20.8-9: πρῶτον μὲν οἱ παῖδες ἐκ νηπίων ᾄδειν ἐθίζονται κατὰ νόμους τοὺς ὕμνους καὶ παιᾶνας, οἷς ἕκαστοι κατὰ τὰ πάτρια τοὺς ἐπιχωρίους ἥρωας καὶ θεοὺς ὕμνοῦσι· μετὰ δὲ ταῦτα τοὺς Φιλοξένου καὶ Τιμοθέου νόμους μανθάνοντες πολλῇ φιλοτιμίᾳ χορεύουσι κ.τ.λ.
- ¹¹⁹ Arist. *Pol.* 1341a9-21.
- ¹²⁰ See Visconti (1999), esp. 64-88.
- ¹²¹ Ps.-Plut. *de Mus.* 1144f.
- ¹²² Cic. *Leg.* 2.15.38-9; cf. Plyb. 4.20-21; D. Chr. 33.57; ps.-Plut. *de Mus.* 1142e-f, 1146b-c.
- ¹²³ Isoc. 15.235: Δάμωνος, τοῦ κατ’ ἐκεῖνον τὸν χρόνον φρονιμωτάτου δόξαντος εἶναι τῶν πολιτῶν; Plut. *Per.* 153e-154b; cf. Cic. *Leg.* 2.15.39.
- ¹²⁴ Damon fr. 37B10 D-K = Pl. *Resp.* 4.424c; cf. Cic. *Leg.* 2.15.39. Cf. Anderson (1966), 189-91 with further literature; West (1992), 246ff.
- ¹²⁵ See Wallace (1991).

established in the time of Terpander—which in its own day had been καινοτομία—endured relatively intact until the fifth century?¹²⁶

- 2.38 On the whole, cooler heads prevailed in Athens, and progressive musicians from other parts of Greece, like Phrynis of Lesbos and Timotheus of Miletus, could generally depend on a receptive audience.¹²⁷ Sparta, as often, represents the opposite end of the spectrum, being in the Classical period notoriously conservative.¹²⁸ In centuries past, however, when she was a more flexible society, Terpander is said to have come with his lyre¹²⁹—doubtless with its new seven strings—to restore the city to ἁρμονία (cf. 2.34). The city's openness to musical innovation at this period is seen in the tradition that the Lesbian singer was the first of several musicians to found there a 'school' of musical instruction¹³⁰—the

¹²⁶ Ps.-Plut. *de Mus.* 1133b-c: see further 7.60-61.

¹²⁷ West (1992), 356ff.

¹²⁸ Cf. Ath. 14.624c-d: Λακεδαιμόνιοι μὲν μάλιστα τῶν ἄλλων Δωριέων τὰ πατρία διαφυλάττουσιν, Θεσσαλοὶ δὲ . . . παραπλήσιον αἰεὶ ποιοῦνται τοῦ βίου τὴν ἀγωγὴν ("Of the Dorians, the Spartans most continue to guard their ancestral ways, and the Thessalians . . . have always led virtually the same way of life").

¹²⁹ A single late tradition has Terpander use the αὐλός rather than the κιθάρα (Sopat. Rh. 4.50f., 5.21 Walz, omitted from Gostoli (1990): cf. Campbell (1993). It is true that only two testimonia explicitly relate the cleansing of Sparta to Terpander's lyre rather than his music generally, but they are both strong witnesses—Dem. Phal. ap. Schol. E Q *ad Od.* 3.267 (144 Dindorf): τοσοῦτον δὲ καὶ πρὸς τὰ πολιτικά διέτεινεν ἡ τῶν κιθαρωδῶν μουσικὴ ὥς τῶν Σπαρτιατῶν τὴν πόλιν ὠφελεῖσθαι λέγουσιν ὑπὸ τούτων τῶν ἀνδρῶν τὰ μέγιστα καὶ πρὸς ὁμόνοιαν καὶ πρὸς τὴν τῶν νόμων φυλακὴν. ὥς καὶ τὴν Πυθῶ, αὐτόθι φερόμενης ταραχῆς, εἰπεῖν, τὸν Λέσβιον ᾠδὸν ἀκούει καὶ παύσασθαι τῆς φιλονεικίας. ὃ καὶ γέγονεν; Diod. Sic. 8.28 ap. Tz. *H.* 1.385-392—and elsewhere Terpander is unanimously made a citharist, his other musical activities in Sparta invariably connected with this instrument. The variant may derive from a misreading of Plut. *Lyc.* 53b-c, which cites the Spartan practice of marching into battle to the αὐλός, and then goes on to mention Terpander's opinion that courage and music go together, finally citing fr. 5 (Gostoli): ἐνθ' ἀλχμὰ τε νέων θάλλει καὶ Μῶσα λίγεια κ.τ.λ.

¹³⁰ Ps.-Plut. *de Mus.* 9.1134b-c: ἡ μὲν οὖν πρώτη κατάστασις τῶν περὶ τὴν μουσικὴν ἐν τῇ Σπάρτῃ, Τερπάνδρου καταστήσαντος, γεγέννηται κ.τ.λ.

Spartans being until then inexperienced in 'music'.¹³¹ No doubt the new heptatony was central to the curriculum.

- 2.39 Here we have a musical change on the scale feared by Damon. And yet, because their philosophies were in harmony with the ideals of Lycurgus the lawgiver,¹³² these early musicians, despite being foreigners, found a welcome which in later times seems to have been exceptional. Even in the Classical period, the Spartans, according to Aristotle, felt capable of judging the morally useful in music even without musical training.¹³³ Plutarch, praising Terpander for fusing music and valor, describes the Spartans as "very musical as well as very warlike" (μουσικωτάτους γὰρ ἅμα καὶ πολεμικωτάτους).¹³⁴ That this was not merely the product of later imagination is shown by Alcman—the first to attest μέλος—who

¹³¹ Ael. *VH* 12.50: Λακεδαιμόνιοι μουσικῆς ἀπείρως εἶχον; cf. Ps.-Plut. *de Mus.* 9.1134b-c. According to a tradition which may go back to Aristotle, Lycurgus was said to have been "first to bring the poetry of Homer to the Peloponnesus, receiving it from the descendents of Creophylus" (τὴν Ὀμήρου ποίησιν παρὰ τῶν ἀπογόνων Κρεοφύλου λαβὼν πρῶτος διεκόμισεν εἰς Πελοπόννησον) following a visit to Samos: Heraclid. *Lemb. Exc. polit.* 10 (Dilts).

¹³² Plut. *Agis* 799f: ἐπεὶ Τέρπανδρόν γε καὶ Θάλητα καὶ Φερεκύδην ξένους ὄντας, ὅτι τὰ αὐτὰ τῷ Λυκούργῳ διετέλουν ᾄδοντες καὶ φιλοσοφοῦντες, ἐν Σπάρτῃ τιμηθῆναι διαφερόντως.

¹³³ Arist. *Pol.* 8.4.1339b2ff.: ὥσπερ οἱ Λάκωνες· ἐκεῖνοι γὰρ οὐ μανθάνοντες ὁμῶς δύνανται κρίνειν ὀρθῶς, ὥς φασί, τὰ χρηστὰ καὶ τὰ μὴ χρηστὰ τῶν μελῶν ("Just like the Spartans: for they, without studying, are able to judge correctly, so they say, the good and bad among musical pieces"); Ath. 14.628b: Λακεδαιμόνιοι δ' ὅτι μὲν ἐμάνθανον τὴν μουσικὴν, οὐδὲ λέγουσιν· ὅτι δὲ κρίνειν δύνανται καλῶς τὴν τέχνην ὁμολογεῖται παρ' αὐτῶν.

¹³⁴ Plut. *Lyc.* 53b-c: οὐ κακῶς ἡγήσαιτο καὶ τὸν Τέρπανδρον καὶ τὸν Πίνδαρον τὴν ἀνδρίαν τῇ μουσικῇ συνάπτειν ("[sc. One] would think that Terpander and Pindar were not wrong to attach courage to music"); cf. *Inst. lac.* 238b: ὁ γὰρ Λυκούργος παρέζευξε τῇ κατὰ πόλεμον ἀσκήσει τὴν φιλομουσίαν, ὅπως τὸ ἄγαν πολεμικὸν τῷ ἐμμελεῖ κερασθὲν συμφωνίαν καὶ ἀρμονίαν ἔχη κ.τ.λ. ("For Lycurgus joined love of music with martial training, so that the excessively bellicose, being blended with proper attunement [τῷ ἐμμελεῖ; cf. 7.45], might have harmony and consonance").

went so far as to exalt the art of music—κιθάρα music—above the art of war.¹³⁵ One thinks also of Achilles, greatest of warriors, “delighting his heart with the clear *phorminx*” (φρένα τερπόμενον φόρμιγγι λιγείη).¹³⁶

- 2.40 During the later fifth century, with the breakdown in Athens of the traditional heptatonic music, we hear of strong measures taken by the Spartan ephors to counter such innovations—punishing Phrynis and Timotheus by cutting away any strings in excess of seven, and commanding them “not to do evil to music” (μὴ κακούργει τὴν μουσικὴν).¹³⁷ Timotheus saw no little irony in this, and in his *Persians* makes much of the fact that, in its day, Terpander’s seven-stringed lyre had been equally revolutionary (see further 8.62-63). The authorities feared that the New Music would make “the city dissonant and unharmonious” (τὴν πόλιν ἀσύμφωνον καὶ ἀνάρμοστον)¹³⁸—a mirror image of Terpander’s civic healing, and confirmation that his seven-stringed lyre was the necessary tool. The view that diatonic music was manly and austere is attested by the *Hibeh Papyrus* and other exemplars of a pre-Aristoxenean tradition,¹³⁹ and since the principles of heptatonic

¹³⁵ Alc. 41 *PMGF*, also cited by Plutarch (*Lyc.* 21.6): ῥέπει (*coni.* Scaliger; MSS ἔρπει *sic* Page/Davies) γὰρ ἅντα τῷ σιδάρω τὸ καλῶς κιθαρίσδην (“To play the κιθάρα well outweighs the sword”).

¹³⁶ Hom. *Il.* 9.186; cf. 13.730f.: ἄλλω μὲν γὰρ δῶκε θεὸς πολεμῆια ἔργα, / ἄλλω δ’ ὀρχηστύν, ἑτέρω κίθαριν καὶ αἰοιδήν, where 731 was perhaps interpolated as a “rhapsodic elaboration”: see Janko (1992), *ad loc.*

¹³⁷ Plut. *Apoph. lac.* 220c; cf. Tim. *Pers.* fr. 15.202ff. (*PMG* 791); Cic. *Leg.* 2.15.39; Plut. *Agis* 799f-800a; *De prof. virt.* 84a; *Inst. lac.* 238c-d; Paus. 3.12.10-11; D. Chr. 32.67, 33.57; Ath. 636e-f = Artemo Cass. *FHG* 4 p. 342 fr. 11; Boeth. *De inst. mus.* 1.1 (182.1ff.) The same tale is also told of Terpander for adding an eighth string (Plut. *Inst. lac.* 238c), but this tradition is contaminated from that of Phrynis and Timotheus: see 8.49-68.

¹³⁸ Plut. *Agis* 800a.

¹³⁹ *PHib.* 13.17ff. The author himself is rejecting the idea that the genera have such powers on their own outside of other considerations, but by adducing the manly diatonic as a counter-example to current allegations, he becomes the first witness to a persistent later tradition: Adrastus ap. Theo Sm. 54.14, 56.4f. described the diatonic as “somewhat majestic and powerful” (σεμνόν τι καὶ ἑρρωμένον) and “a bit simple and noble” (ἀπλοῦν τι καὶ γενναῖον); [Aristid. Quint.] 2.19 (92.23-24): ἀρρενωπὸν δ’ ἐστὶ καὶ αὐστηρότερον (“it is masculine and quite severe”); Boeth. *De inst. mus.* 1.21 (212.26): *diatonum quidem aliquanto durius*. See further 7.33-37.

tuning are ultimately diatonic in origin, there can be little doubt that, even if they knew of other heptatonic forms, diatonic music would have been most welcomed by the Lacedaimonian authorities. Plato too, opposed to the “polychordy” (πολυχορδία) of the New Music and devoted to the diatonic in the *Timaeus*, would have admitted this tuning method to the puritanical—downright Spartan—musical education he envisioned for his ideal state.¹⁴⁰ It would seem, then, that in Sparta the Orientalizing music experienced, like the city itself, a deliberately arrested development. This stony resistance is captured in a statue described by Pausanias—a woman holding a lyre, and thought to represent Sparta.¹⁴¹

- 2.41 Though the New Music saw a partial breakdown of its ancient principles, the long-term influence of heptatony was decisive in Greece, just as it persisted as the basis of the σύστημα τέλειον and the art of ἁρμονική itself. The introduction of diatonic scales in the Orientalizing epoch seems to have created an environment in which, taken as a whole, the Greeks’ inherited intonational instincts were gradually assimilated to tone-structures established through resonance. Thus, although the syncretic music of the Archaic and Classical periods saw the partial assimilation of these tunings to the Greeks’ own melodic instincts, the ultimate result of the process was the dominance of diatony, already on the rise in the time of Aristoxenus (who reports the evanescence of the microtonal enharmonic γένος), and coinciding with the cosmopolitan, *koine* atmosphere of later antiquity with its more generalized forms of language, literature, and art.¹⁴² From here, diatonic music—undergoing continual development—came in time to Rome and Byzantium, and so on down from the ancient world.

¹⁴⁰ Pl. *Resp.* 3.399c-d; *Lg.* 812b-813a.

¹⁴¹ Paus. 3.18.8: γυναῖκα . . . ἔχουσιν λύραν, Σπάρτην δῆθεν.

¹⁴² Aristox. *Harm.* 23; cf. ps.-Plut. *de Mus.* 38.1145a-c; D.H. *Comp.* 2; Ptol. *Harm.* 1.16 (38.1-6); Macr. *Somn. Scip.* 2.4.13 [*sc. enarmonium*] *propter nimiam sui difficultatem ab usu recessit*; Mart. Cap. 9.957: *nunc maxime diatono utimur* (“now we use the diatonic most”); West (1992), 164-165. The later theorists still regularly treat the enharmonic, and that it did not altogether disappear from practice may be inferred from Vitruvius’ first-century discussion of acoustic resonators for theatres, some of which were to respond to this γένος (*De arch.* 5.4).

3.0 Homer's Lyre: The Indo-European Music-stream

- 3.1 Because heptatonic scales are now so familiar, Terpander's ἐπτάτονος φόρμιγξ causes little discomfort. More problematic is the putting aside of "four-voiced song" (τετράγηρυν . . . αἰδάν). In this regard, the fragment has been the subject of a long-standing controversy. Deubner (1929) argued that the ancient interpretation of these verses—as seen for example in Strabo (cf. 3.10)—should be upheld, that they bear witness to an historical change of the Greek lyre from four to seven strings. At that time, the notion of a four-stringed instrument had been rejected as ludicrous by Wilamowitz and others, who saw it as a back-formation of the Hellenistic period, for whose theorists, as post-Aristoxeneans, the tetrachord was an important unit of analysis.¹ Deubner supported his argument with a thorough survey of the then-available representations from the Mycenaean period through the early Archaic. Recognizing that in some cases an artist might be limited by space, material, or interest in realism, he showed that the art of the Geometric period is, on the whole, consistent in showing instruments of three or four strings.² It seemed that the seven-stringed lyre, which was predominant in the Mycenaean period,³ began to resurface in the late-eighth century, being firmly re-established by the middle of the seventh—just when the Lesbian singer was said to have lived. Deubner (1930) went on to argue that Terpander's inspiration came from his knowledge of Near Eastern instruments, known to have been many-stringed (i.e. seven or more), in support of which he pointed to Pindar's portrait of the poet at Lydian banquet tables, where he was introduced to the πηκτις (cf. 2.15).
- 3.2 The quickness of nineteenth-century scholars to reject a four-voiced music seems surprising today, with many traditions now documented which use only a few pitches. It is not merely that a four-stringed lyre seemed beneath the dignity and imagination of the Greeks: such traditions were simply not known. Bartók himself, who made such important contributions to the ethnomusicology of the Balkans, was at first

¹ Likewise, Winnington-Ingram (1936), 10ff. cautioned that theories about early Greek music should not to be based on the tetrachord.

² Subsequent surveys of four-stringed and other lyres of fewer than seven strings include Gombosi (1939), 48ff.; Wegner (1949), 222f.; (1968), 2-16; for new seven-stringed examples from the Archaic period, see Gostoli (1990), XXXIX-XLI. On the issue of instruments with other than four or seven strings, see below.

³ Anderson (1994), 1-16, gives a good overview of the Mycenaean and Minoan evidence and of the evolution of Greek instrument types in general; Younger (1998) now provides a comprehensive collection of the Bronze Age evidence.

unaware of the existence of the South Slavic epic song tradition in his own backyard. There is now no *a priori* reason to doubt the existence of a “four-voiced song”, and on the whole recent scholarly opinion has accepted either a standard Homeric lyre of four strings; or, more flexibly, lyres which could intentionally have fewer than seven-strings.⁴

- 3.3 But the attack against the tradition was relaunched by Maas/Snyder (1989), vehemently condemning Deubner’s article as “influential and unfortunately misleading”.⁵ (For the record, Deubner was merely trying to confirm what musicologists had already long entertained on the strength of the ancient tradition; this is the direction of influence.⁶) On the basis of the Mycenaean and Minoan evidence, Maas and Snyder maintain that the lyre had always been seven-stringed.⁷ Their case is weakened by the attempt to explain away the ancient traditions, accepted by most scholars, of ever increasing πολυχорδία in professional instruments of the fifth and fourth centuries. As they see it, the lyre remained seven-stringed even through the modulatory New Music of the late fifth century, the traditions being due to comic hyperbole and post-classical misunderstanding.⁸ It is true that the seven-stringed lyre persisted into later centuries, especially at the popular and educational levels, and this is a crucial fact (cf. 7.15). But the gradual addition of strings by professionals like Phrynis, Philoxenus, and Timotheus can hardly be doubted.⁹
- 3.4 The mainstay of the argument against a four-stringed lyre has always been the supposed unreliability of the plastic and ceramic evidence in the Geometric period.

⁴ Gombosi (1939), 19, 48ff.; (1944), 172; Wegner (1949), 29; Picken (1975) 597f.; West (1981), 115; cf. (1992), 52, 330 with n.7; Barker (1982-9), 1.43 n. 18; Gostoli (1990) XXXIX-XLI; Anderson (1994), 61ff.

⁵ Mass/Snyder (1989), 26, 36, 203.

⁶ E.g. Hawkins (1776), 1.3ff.; Helmholtz (1895).

⁷ Mass/Snyder (1989), 203: “Variations of a minor sort probably occurred, but in essence the seven-stringed lyre remained seven-stringed from before the days of the Trojan War to the time of Alexander the Great and probably beyond.” In this they have been followed by Younger (1998), 20 and n. 51, and themselves followed e.g. Shipton (1985), 117 n.21; Duchesne-Guillemin (1967) and Allen/Halliday/Sikes (1936), 274f. Deubner (1929) himself allowed for a continuous history of heptatony: “Dass Terpander die siebensaitige Leier nicht im eigentlichen Sinne erfunden haben kann, ist durch den Sarkophag von Hagia Triada bewiesen” (195). See further below.

⁸ Mass/Snyder (1989), 62f.

⁹ See e.g. Anderson (1994), 140.

Maas and Snyder warn that the Geometric depictions are not to be trusted, their crudeness revealing a lack of concern as to the finer points of chordophone construction; space and material bring further limitations.¹⁰ It is true that the evidence of ancient paintings has been abused by those who accept every variation in string number as reflecting some definite tonal reality.¹¹ But for the Greek evidence of the Geometric and Archaic periods, Deubner's judicious examination has been sufficiently defended by West (1992):

Certainly in some cases we may say that a painter or the maker of a small model had room for only three or four strings in the space available, given the thickness of his brushstrokes or the metal strands he could make. But in other cases more strings could easily have been accommodated; and in view of the quantity of the evidence, besides the existence of a literary tradition . . . Perhaps some [*sc.* lyres] had only three, but as between three and four the artistic evidence does not have the same probative value as it has between four and seven, and we should expect there to be a standard number corresponding to the requirements of a particular type of singing.¹²

3.5 With two exceptions, Geometric art does in fact show instruments of three or four strings, and occasionally two or five.¹³ The two exceptions come in the late eighth

¹⁰ Mass/Snyder (1989), 203.

¹¹ See, for example, the elaborate evolutionary scheme devised by Gombosi (1944).

¹² West (1992), 52 and n. 15.

¹³ The description in Ps.-Plut. *de Mus.* 1137a-b of early music as "simple and three-pitched/stringed" (τρίχορδα . . . καὶ ἀπλᾶ) probably does not relate to such instruments. Barker (1982-9) 1, 223 n. 124 persuasively argues that three pitches per tetrachord are intended, since this passage clearly recalls the earlier description (derived from Aristoxenus) of the enharmonic of Olympus (cf. 1135a-b), which omitted 'diatonic λιχανός' (cf. 1.4, 1.12, 1.25, 7.21, 7.39). If Barker's interpretation is correct, then how does this relate to Terpander, who has just been mentioned in company with Olympus, and whose hallmark is always the seven-stringed lyre? If the Libation Music of Olympus were not so neatly accounted for, one might try to associate τρίχορδα with the three- and four-stringed Geometric instruments and τετράγηρυν αἰδάν—that is, to the older style which 'Terpander' seems to have continued performing alongside the new heptatony (cf. 2.29). Sources which describe an archetypal three-stringed lyre (e.g. D. S. 1.16.1, ps.-Censor. *de Mus.* 6.610.1f.) derive from the schematization of the archaic heptachord through its boundaries (see further 9.38-39); conceivably this could be the reference. But the simplest solution is to suppose that τρίχορδα applies only to the Libation Style discussed earlier. Olympus is mentioned by himself in this final statement (τρίχορδα γὰρ ὄντα καὶ

century,¹⁴ just when Orientalizing elements are beginning to saturate Greek culture. One cannot apply a double standard. The evidence is only unrealistic only if one decides in advance that seven strings had been standard from the Mycenaean period onwards. For the sake of argument, one could assume that four-stringed lyres had always been the norm, with seven-stringed depictions the result of artistic fantasy and abundance of space. Provided one observes proper caution—as Deubner did—it is better to trust the overall reliability of the artists at each period, and confront the difficulties this raises. If a believable explanation can be found for the various changes, the artistic evidence will fall into place.

- 3.6 The Minoan and Mycenaean evidence, then, is a difficulty which has yet to be overcome. After all, if the lyre had once been seven-stringed, why should there have been a ‘regression’ to less than seven? Of those who have accepted the Terpendean tradition, Deubner was alone in proposing a solution: though the seven-stringed lyre was developed in Crete during the palatial period, it was slow to supplant an older four-stringed lyre, and Terpander was merely given credit for the final victory.¹⁵ But the hypothesis of a gradual diffusion from Crete is now undermined by finds of seven-stringed lyres at mainland sites in the Mycenaean period.¹⁶ This distribution suggests a division not between Crete and the mainland, but between palace and village: lyre-players are depicted in palatial art, and are now attested among the palace personnel in Thebes (cf. 4.5, 5.7). Other scholars who accept that lyres went through a period of fewer strings in the Dark Age have offered no explanation, though West (1992) recognizes that the phenomenon has important tonal implications.¹⁷

ἀπλᾶ διαφέρει τῶν ποικίλων καὶ πολυχόρδων, ὥς μηδένα δύνασθαι μιμήσασθαι τὸν Ὀλύμπου τρόπον, ὑστερίζειν δὲ τούτου *suppl.* Bernardakis) τοὺς ἐν τῷ πολυχόρδῳ τε καὶ πολυτρόπῳ καταγινομένους), and though Terpander has just been mentioned twice in company with him, there the contrast was with πολυχορδία and ποικιλία, which in other sources are measured as deviations from the standard seven strings: see further 8.49-65.

¹⁴ See West (1992), 51f.

¹⁵ Deubner (1929), 198f.: “Terpander es war, der die siebensaitige Leier zwar nicht erfunden, aber doch für die Griechen zuerst an Stelle der bis dahin üblichen viersaitigen eingeführt und kanonisiert hat”. Cf. West (1992), 330.

¹⁶ See Younger (1998), 61ff.

¹⁷ West (1992), 328: “it suggests a more restrained style of singing that used a smaller compass, perhaps not more than a fifth”.

3.7 Maas and Snyder object further to Deubner's textual interpretation of the fragment:

Even if the lines are genuine, they need not refer to the replacement of a four-stringed instrument with a seven-stringed one; the first line refers only to "four-voiced song", which might be taken in opposition to the "new hymns" of the next line, rather than to the "seven-toned phorminx". The poet may only be saying that he is casting aside an old form of song in favor of a new one that is accompanied by the phorminx. The lines do not say that the phorminx ever had fewer than seven strings.¹⁸

The antithesis which Maas and Snyder wish to create—between "four-voiced song" and "new hymns", with the "seven-toned phorminx" irrelevant to the disjunction—is impossible. By any interpretation, τετράγηρυν αοιδάν must mean a song or style using four pitches. The alternative, a song for four voices, is impossible. The numerical elements ἑπτα-/τετρα- mark out the true antithesis, while -τόνωρ requires that -γηρυν ("voice") be a single melodic element, as commonly later with φωνή. Now, the Homeric αοιδός did not, as a rule, sing without his lyre.¹⁹ If we may take South Slavic heroic song as the closest extant cognate tradition (see below), it is very likely that the φόρμιγξ provided the voice with an accompaniment which, if not always—or ever—in strict unison, was at least of similar pitch range.²⁰ An oral poet uses his instrument primarily to mark rhythm as an aid to composition within the necessary metrical restrictions.²¹ Whatever the value of Saint-Saëns' comparison with modern African lyre-technique,²² and however much melodic composition may have changed in the melic revolution, it is probable that epic lyre accompaniment involved a certain amount of heterophony in the form of rhythmic strumming, where the function of string-pitches would be to provide the singer with his palette of tones. While this function does not absolutely exclude a close correspondence between vocal

¹⁸ Mass/Snyder (1989), 203.

¹⁹ Apart from the fact that Demodocus, Phemius, and Achilles are so portrayed by Homer, there is the explicit literary testimony of e.g. S. E. M. 6.16-17 (166.17f.): τὰ Ὀμήρου ἔπη τὸ πάλαι πρὸς λύραν ᾗδετο ("The epics of Homer were of old sung to the lyre"); conversely, Hesiod was considered anomalous for *not* playing the lyre: cf. Paus. 10.7.3: λέγεται δὲ καὶ Ἡσίοδον ἀπελαθῆναι τοῦ ἀγωνίσματος ἅτε οὐ κιθαρίζειν ὁμοῦ τῇ ᾠδῇ δεδιδαγμένον ("And it is said that Hesiod too was ruled out of the [*sc.* Pythian] competition, not having learned to play the *cithara* along with his singing").

²⁰ Nothing about the technical phrase ὑπὸ καλὸν αἰδε(ν) (Hom. *Il.* 18.570; *Od.* 21.411; *h. Merc.* 54, 502) implies *unison* accompaniment. On this expression, see further 5.15.

²¹ See Lord (1980), 46.

²² See Gombosi (1944), 178f.

and instrumental ‘melody’—recalling that the word is anachronistic in the description of Homeric music (cf. 2.31-32)—clearly it would do little to foster such a relationship.

- 3.8 In the South Slavic tradition, the singer accompanies himself with the *gusle*, a member of the lute family (i.e. having a fingerboard) whose one string can produce a number of pitches through stopping. The accompaniment here is obviously monophonic, and is almost never in strict unison with the voice. Its primary function, while not without a melodic component in that it makes use of differences of pitch, is rhythmic. At the same time, it uses approximately the same pitch range as the voice, and often ‘sings’ a simpler counter-melody—or better ‘rhythm-melody’—as may be seen from Bartók’s transcriptions.²³ In Greece, where the epic singer’s instrument was a lyre, each string of which gave out only one pitch,²⁴ the quantification of ‘voice’—compare the later use of φωνή in terms like συμφωνία and ἐπτάφωνος—must have a parallel implication for string number, and vice versa. This reading of Terpander’s language finds clear parallels in Pindar’s φόρμιγγά τε ποικιλόγαρυν and Bacchylides’ ἐπτάτονον . . . γάρυν, of a seven-stringed lyre’s accompaniment.²⁵ Sophocles too uses γῆρυν of the instrument’s voice in the *Ichneutai*, which dramatized the myth of Hermes’ invention.²⁶ Compare also Euripides’ πολυχорδοτάτα γῆρui and πολυχόρδοις ᾠδαῖς.²⁷ Thus, τετράγηρυν ἀοιδάν can only mean a melodic division into four pitches, accompanied by a φόρμιγξ which, if not invariably four-stringed, would certainly fall short of being heptatonic. Of course, it is possible that an earlier four-

²³ Parry/Lord/Bartók (1954); cf. Lord (1960), 37-41; Foley (1999), 71, who notes that both vocal and instrumental lines have a marked tendency to be phrased according to the decasyllable; that is, the stichic repetition of the metrical unit is strongly felt by the singer.

²⁴ I leave aside the question of whether lyre-strings were ever stopped to yield additional notes: see e.g. Gombosi (1944), 179f. Roberts (1980) found in her reconstructions that stopping produced acceptable results, comparable to *pizzicati*. But I have heard this technique at the expert hands of Stelios Psaroudakes, with practically no difference in tone color. Given Aristophanes’ testimony that students were introducing modulations to their music lessons, where seven-stringed lyres were standard (cf. 7.17), I think we must accept stopping as a familiar, if occasional, technique. Yet Homeric accompaniment is an entirely different question, and I doubt very much that the technique would have been practicable during composition-in-performance. Cf. West (1981), 116.

²⁵ Pi. O. 3.8; cf. N. 5.22: φόρμιγγ’ . . . ἐπτάγλωσσαν; B. fr. 20B.1f. (Snell): ᾠδὴν βάρβιτε, μηκέτι πάσσαλον φυλλάσ[σων] / ἐπτάτονον ἱλιγυρὰν κάππαυε γάρυν.

²⁶ S. *Ichn.* 297 (Maltese).

²⁷ E. *Rh.* 548; *Med.* 196.

voiced music could later be sung on a seven-stringed instrument by using only part of its range, and that this is the context of the poem.

3.9 The deeper problem with Maas and Snyder's criticism is that the reading is not merely Deubner's, but that of Strabo and many other ancients. Terpander's authority as an innovator rests on information considerably older than the Roman geographer, antedating the period of theoretical schematization in the late fifth and fourth centuries. From Aristoxenus comes the fragment of Pindar which attests Terpander's ties with Lydia and the invention of the βάρβιτος.²⁸ Timotheus, too, attests the legend of Terpendrean novelty (cf. 8.61-65). The tradition marks the continuity of Greek musical memory in the Archaic period—a perfectly believable achievement, given that historically the preservation of ancient lore had long been entrusted to musicians.

3.10 Finally, Maas and Snyder question the authenticity of the fragment, an issue not addressed by Deubner. Strabo himself is dubious, they say, citing λέγεται ("it is said") as evidence of the geographer's reluctance to commit himself:²⁹

Τέρπανδρον . . . τὸν πρῶτον ἀντὶ τῆς τετραχόρδου λύρας ἑπταχόρδῳ
χρησάμενον, καθάπερ καὶ ἐν τοῖς ἀναφερομένοις ἔπεσιν εἰς αὐτὸν λέγεται.³⁰

Terpander . . . the first to use a seven-stringed lyre instead of a four-stringed one, exactly as it is said in the verses ascribed to him.

But λέγεται cannot imply a questionable popular opinion: it merely reports the content of the verses. ἀναφερομένοις ("ascribed"), on the other hand, might have been used to support the argument, since it raises the issue of the verses' attribution.³¹ But even if Strabo had his doubts as to Terpander's authorship, there is no sign that he did not believe in the tradition itself; quite the opposite, as can be seen from καθάπερ καὶ. And in fact, as we have seen, belief in the tradition is well-attested throughout antiquity.

3.11 The issue of authenticity is, at any rate, beside the point. As Deubner argued from the start, it need not be literally true that Terpander was the first to use a seven-stringed

28 Pi. fr. 125 (S-M).

29 Mass/Snyder (1989), 26 and n.17.

30 Str. 13.2.4.

31 Cf. Wilamowitz (1903), 64 n.1.

lyre: he may only have been instrumental in popularizing it.³² West (1992) has taken this view a step further, suggesting that Terpander need only have been a prominent name with whom later memory could associate a large-scale change in musical tastes.³³ Indeed, taking Terpander's *floruit* (let us say 675) to mark the mainstream acceptance of seven-stringed tunings, and counting backwards by two generations to allow for a larger movement of which Terpander was the culmination (perhaps 725), the Lesbian gleeman may be seen as representing a musical movement which corresponds very closely to the Neo-Assyrian acme.³⁴ Though certainly historical, Terpander—like the archetypal *guslar*³⁵ and Homer himself—grew to symbolize the melic revolution. This is the more attractive for being able to accommodate the numerous other innovations attributed to him.³⁶ Thus, as we have seen, the anonymous corpus of citharodic preludes was ascribed to the Lesbian singer (2.29). Such a situation could also underlie reports that Terpander received credit for some of Philammon's musical contributions—though Philammon is himself a mythical figure.³⁷ Also of interest is the tradition, parallel to that of Terpander, which makes Amphion, having added three strings to an earlier four, learn the “the tuning of the Lydians” (τὴν τε ἁρμονίαν τὴν Λυδῶν).³⁸ These and other such testimonia should not be regarded as a hopelessly inconsistent jumble of tales, but as a document of heterogeneous musical change throughout the whole of Greece, with all its regional subtraditions, over several generations. What is important, then, is not whether the

³² Deubner (1929), 195.

³³ West (1992), 330: “Much of this [list of innovations] was no doubt constructed by projecting Classical citharodes' practice and repertory back upon the first famous citharode to be remembered.”

³⁴ It is not surprising, then, that depictions of seven-stringed instruments are quite rare in the first part of this transitional period, even allowing for the decreased sample size (See West [1992], 52), while at the same time instruments of fewer than seven strings are also attested, e.g. a five-stringed lyre from Attica (c. 700): Anderson (1994), fig. 11.

³⁵ On the legendary *guslar*, see Foley (1999), 49-56.

³⁶ Cf. West (1992), 329f.; Barker (1982-9), 1.43 n. 18.

³⁷ Ps.-Plut. *de Mus.* 1133b: τινὰς δὲ τῶν νόμων τῶν κιθαρωδικῶν τῶν ὑπὸ Τερπάνδρου πεποιημένων Φιλάμμωνα φασὶ τὸν ἀρχαῖον [τὸν Δελφὸν *del. ego*] συστήσασθαι (“They say that the ancient Philammon [of Delphi] composed some of the citharodic nomes which were used by Terpander in his poetry”)—the odd repetition of the article suggests an interpolation, glossing Philammon; cf. *Suda* s.v. Τέρπανδρος: ὃς πρῶτος ἑπτὰ χορδῶν ἐποίησε τὴν λύραν καὶ νόμους λυρικοὺς πρῶτος ἔγραψεν; εἰ καὶ τινες Φιλάμμωνα θέλουσι γεγραφέναι.

³⁸ Paus. 9.5.7-8.

Greeks believed in the authenticity of Terpander's poem, but whether they believed their music underwent significant change in the early Archaic period. In fact, as we have seen, there were many musical figures from this time who were remembered as innovators, often with Asian associations (cf. 2.2).

- 3.12 Deubner's hypothesis, while not answering all the questions raised by this fragment, nevertheless rests upon sound methodology. The conflicting indicators of the ceramic evidence are not to be dismissed, but should be welcomed as an opportunity for discovering greater historical complexity. There are three essential issues, to be treated one each in this and the following two chapters: the meaning of τετράγηνον αοιδάν in the context of pre-Orientalizing Greek music; the place of the Mycenaean seven-stringed lyre within this music stream (4.0); and the broad changes to earlier tradition wrought by the heptatonic καινοτομία of Terpander (5.0).
- 3.13 Accepting that a four-stringed φόρμιγξ had been the instrument of the epic singer, West (1981) suggested that this instrument implied a limited melodic range which might be typical of the ancestral Indo-European song tradition, and made an ingenious (and admittedly speculative) reconstruction of the four-pitched tuning with which the αοιδός accompanied his melodies. In support of such limited melodic ambitus, West pointed to Serbo-Croatian heroic song (see below) and to the chanting of the *R̥gveda*, in which the words' ancient pitch accents are stylized into a three-pitched melody. Given that the tonal accent was an original part of Proto-Indo-European, he suggested the possibility that "the practice of 'singing' texts by disposing the syllables over a limited set of fixed notes according to their accents was also Indo-European".³⁹ The Indo-European basis of Vedic song has been challenged by other scholars, who see the accent-singing as a secondary development.⁴⁰ That the Indian vocal art does not match the Greek system of accents poses no problem in itself, however, for musical practice would naturally diverge alongside the respective languages. Be that as it may, 'speech-song' occurs in many forms throughout the world, and such traditions were probably already ancient at the time of Indo-European unity.⁴¹ The fact remains that the hymns of the *R̥gveda* are proven descendants of the Indo-European song tradition, whatever its melodic art may have entailed originally.
- 3.14 In theory, at least, the general melodic character of the ancestral art might be understood in the same way as Proto-Indo-European itself, by deduction from the

³⁹ West (1981), p. 114.

⁴⁰ Burrow (1973), 115; cf. Anderson (1994), 46.

⁴¹ Wiora (1959).

comparative evidence of the daughter traditions. The progressive linguistic divergence of these from their reconstructed parent is now quite well understood. Just as verbal sound laws may be drawn between languages as dissimilar as Greek and Sanskrit, it is possible to do the same for cultural institutions—which may change much more slowly than language—and an astonishingly rich picture of Indo-European culture has emerged in this way.⁴²

- 3.15 Recent work on Indo-European poetics has grown from the fundamental breakthrough in the area of metrics, from which it is necessary to infer an ancestral art, based on the distinction between long and short syllables and using certain fundamental patterns, which split into a number of subtraditions.⁴³ Even more than linguistic kinship, this brings to life the reality of a unified Indo-European culture—“so small a language community that dialect differentiation on a spatial basis played no part”⁴⁴. It also demonstrates the astonishing powers of conservation possessed by the singers.⁴⁵ The reconstruction of poetic diction depends on the assumption that the metrical element developed side-by-side with a continually evolving repertoire of word-formulae, built up over generations, which Parry (1930, 1932) proved to be the primary compositional tool of both the Serbo-Croatian and Greek heroic singer. These formulae were used as building blocks in the improvised song-telling of traditional stories, no two versions of which were ever the same, although the storyline itself—the Aristotelian *μῦθος*—might be considered a unique entity. This process explains the seemingly paradoxical statement of the *αοιδός* Phemius, who asserts “I am self-taught, and a god implanted all sorts of tales in my mind.”⁴⁶

⁴² See especially Benveniste (1973); Polomé (1982); Watkins (1995).

⁴³ The foundation was laid by Meillet’s (1923) comparison of Greek and Indic verse; Jakobson (1952), Watkins (1963), and Cole (1969) established the Indo-European nature of Slavic, Celtic, and Italic metre respectively; for Nagy’s (1974) comparison of Greek and Indic metre, see below.

⁴⁴ W. Meid ap. Szemerényi (1996), 30.

⁴⁵ Further cognate phrases and semantic doublets are catalogued by Schmitt (1967); (1968).

⁴⁶ Hom. *Od.* 22.347f.: *αὐτοδίδακτος δ’ εἰμὶ, θεὸς δέ μοι ἐν φρεσὶν οἶμας / παντοίας ἐνέφυσεν*. As Dodds (1951), 10 explained, “The two parts of his statement are not felt as contradictory . . . he has not memorized the lays of other minstrels, but is a creative poet who relies on the hexameter phrases welling up spontaneously as he needs them out of some unknown and uncontrollable depth; he sings ‘out of the gods,’ as the best minstrels always do”.

- 3.16 Taking this as his departure point, Nagy (1974) made a case study of a pair of phrases first noted by Kuhn (1853)—Greek κλέος ἄφθιτον and Sanskrit *śráva(s) ákṣitam*—which are phonologically, quantitatively and accentually equivalent (< PIE **klewos ṛdhg^whitom*, “imperishable fame”). These, he argued, constitute cognate poetic formulae which, by a fortunate accident, had been handed down intact over the millennia by singers who, originally, must have known the same songs and shared an archetypal repertoire of poetic formulae. According to this approach, elements of Proto-Indo-European poetic diction may be tracked through the overgrown jungle of metrical data, like a single tagged animal will reveal the peregrinations of its species. The formulaic character of κλέος ἄφθιτον has since been questioned,⁴⁷ and many scholars now believe that “the hierarchical dependence of metrical form on phonological and phonetic form makes actual reconstruction of metrics an unrealistic goal”.⁴⁸ Nevertheless, the large amount of poetic phraseology which can now be reconstructed⁴⁹ requires us to suppose some coevolution of diction and metre.
- 3.17 Although many of the Greek and Indic metres as we have them are fixed grids into which words of matching syllabic quantities were fitted, they cannot have been so originally; for otherwise we should expect to find cognate poetic material in identical metres. Because they occur in different but related metres, the fixed classical forms must have come about incidentally in the course of musical evolution. That is, as certain word combinations were used again and again in the telling of tales, they became fixed formulae, which in turn influenced the singers’ compositional process: “the changes follow the patterns of the stable formulae, because the singer thinks in those patterns.”⁵⁰ As the various formulae were used in tandem, larger patterns began to result. These in turn could change as phonological developments took place within the language itself and words acquired new metrical properties.⁵¹ By a continual feedback process, certain patterns became ossified until they did come to function, effectively, as grids. It is important to realize, however, that the Greek metrical art as a whole continued to unfold down into the Classical period, alongside certain fixed forms. The dactylic hexameter was one of these, its evolution complete some time

⁴⁷ Finkelberg (1986) argues that κλέος ἄφθιτον, which occurs only once in Homer, was an *ad hoc* creation modelled on other well-established formulae. Yet its frequency in later poetry might well mean that it was not simply a Homeric borrowing, and that its lack of repetition in Homer is insignificant.

⁴⁸ Watkins (1982), 164f., with further literature; see also Ruijgh (1995); Gasparov (1996).

⁴⁹ See especially Watkins (1995).

⁵⁰ Lord (1980), 41.

⁵¹ Nagy (1974), 50.

before Homer. Yet, even here, metrical anomalies reveal traces of obsolete phonology, in some cases antedating Linear B.⁵²

- 3.18 These discoveries confound rigid notions of genre distinctions. **klewos ndhg^whitom*, for example—if it truly was an Indo-European formula—surfaces in the epic song of Homer, the non-epic, more ‘lyric’ hymns of the *Rgveda*, and in a poem of Sappho which is not *hexametric*, but which is partially dactylic.⁵³ As Aristotle noted, metre is an insufficient criterion for defining genre.⁵⁴ Note that ‘lyric’, like ‘melody’, is at any rate an anachronistic term, if one accepts the *communis opinio* that the Indo-Europeans knew no form of the lyre before their contact with the Near Eastern cultural sphere. And of course Greek epic was also accompanied by the lyre. The discovery of Indo-European metrical kinship makes it necessary to suppose that, though there will have been different kinds of song, these must have been at one time indistinct as to their basic musical elements, *being drawn from a single, homogeneous musical language*. Because of this, the lack of attested ‘lyric’ poetry contemporary with Homer need not pose an insurmountable obstacle to establishing the general characteristics of Greek music prior to the Orientalizing period. Indeed, it is certain that the conservative Aeolic tradition preserved inherited metrical features in a very archaic, ‘pre-Homeric’ state. The ‘lyric’ structures used by Sappho and Alcaeus best reveal the survival of Indo-European features, while the dactylic hexameter represents but one special—and relatively late—development of these.⁵⁵ For the formulae of Homer, when their internal rhythms are considered outside of their hexametric context, frequently coincide with the metres used by the Aeolian poets.⁵⁶
- 3.19 Since the metrical and dictional data are drawn from the most ancient material available in each of the subordinate traditions, and in every case this is song,⁵⁷ one must posit for the Indo-Europeans a unified musical stream of which the metrical and dictional were two components, and for which there must also have been a melodic aspect. The

⁵² West (1988), 156f.

⁵³ Sapph. 44.4 (Voigt).

⁵⁴ Arist. *Po.* 1447a28ff., esp. 1447b17-20: οὐδὲν δὲ κοινόν ἐστιν Ὅμηρῳ καὶ Ἐμπεδοκλεῖ πλὴν τὸ μέτρον, διὸ τὸν μὲν ποιητὴν δίκαιον καλεῖν, τὸν δὲ φυσιολόγον μᾶλλον ἢ ποιητὴν (“but Homer and Empedocles share nothing besides metre, wherefore it is right to call the one a poet, but the other a natural scientist rather than poet”).

⁵⁵ See Nagy (1974); West (1982), 29f.

⁵⁶ Nagy (1974), 15, 27ff.

⁵⁷ Cf. Lord (1962), 180ff.

Slavic, Indic, and Greek traditions have provided essential comparanda for a reconstructed picture of this unified musical stream in its metrical and dictional aspects (see below). Because of this, the analogy of Slavic and Greek epic, though often abused in the study of Homer, remains fundamentally valid.⁵⁸ Obviously, the two have evolved along very different lines. But a number of shared phenomena—formulaic phraseology, metrical anomalies deriving from formula fossilization, heterogeneous dialectal elements with synchronic and diachronic dimensions⁵⁹—can only be explained as deriving from a single method of building poetry. Since no epic tradition has survived into modern Greece,⁶⁰ the cognate South Slavic tradition, different though it may be, is the only evidence which has any real claim to illuminating the melodic practice of Greek epic.

- 3.20 From his study of Serbo-Croatian folk songs in the Parry collection, Bartók was surprised to discover how many melodies were of restricted scope: a full third of those transcribed spanned only a ‘fifth’, but more often a ‘fourth’ or less.⁶¹ (These interval measures, deriving from diatony, are for this music approximate and anachronistic.) For the most part these were ‘ceremonial’ songs, those which could not be dissociated from certain ritual contexts, taken in the broadest sense—work songs (hay gathering, harvest), cradle-songs, wedding-songs, laments, children’s songs, calendar songs, rain-begging songs, and so forth. A number of these ‘genres’ are also alluded to in Greek sources, beginning with Homer.⁶² The equally ancient South Slavic heroic song is itself essentially ritualistic, serving as the historical record of a people, performed in prescribed social settings, and constituting “a necessary part of the social life of the family or of a community”.⁶³ Tacitus described how the ancient Germanic peoples “celebrate in ancient songs, which is the only kind of record and archives that they have” (*celebrant carminibus antiquis, quod unum apud illos memoriae et annalium genus est*), mythological stories and the interrelations and migrations of the kindred tribes, using song also for divinatory purposes.⁶⁴ Caesar left a crucial description of the Celtic druids as guardians of lore through song, the

⁵⁸ See generally Foley (1999).

⁵⁹ See Foley (1999), 66-88.

⁶⁰ Lord (1991), 93.

⁶¹ Bartók/Lord (1951), 52-6; 60.

⁶² See West (1992), 28f.

⁶³ Lord (1962), 181.

⁶⁴ Tac. *Germ.* 2-3.

sacred injunction against the use of writing—an Indo-European characteristic⁶⁵—and the regional schools where training could take as much as twenty years; Diodorus, who uses the term ‘bard’, describes their songs of praise and blame, and the lyre with which they accompanied themselves.⁶⁶ Oral composition characterized all of these traditions, and while they flourished, the individual song was continually new, describing recent as well as ancient events. Thus, in the living South Slavic tradition, one encounters jarringly modern details, such as the hero armed with a rifle. At the same time, however, we must suppose the continual fossilization of certain songs, where faithful recitation was crucial to the song’s efficacy. In the Greek and Indic traditions, oral composition as a whole eventually became static. The recitation of the *Iliad* and *Odyssey*, for example, became a ritual in itself, that of preserving and learning from the poetic monuments of the ancient style. The same may be said of the Vedic canon, fixed hymns which descend from an originally oral style of composition; here, however, their ritual preservation was religiously driven.⁶⁷

- 3.21 Having observed such material throughout the Balkans, Bartók posited an ancient pan-Slavic musical tradition of which limited melodic compass was a defining feature.⁶⁸ He had no cause to look beyond the Balkans; but if his hypothesis is right, one might well suppose that the tradition from which it descended will have used melodies no

⁶⁵ Caes. *B Gall.* 6.13-14: *neque fas esse existimant ea litteris mandare . . . quod neque in vulgum disciplinam efferi velint neque eos, qui discunt, litteris confisos minus memoriae studere* (“And they think it unlawful to entrust these verses to writing . . . because they do not wish the learning to be made common knowledge, and they do not wish those who learn it to develop the memory less through their reliance on writing”); cf. Polomé (1982a), 166f.: “The reserved attitude of the Indo-Europeans was translated in their piety by a set of interdictions . . . their tradition was transmitted orally, and after some of them acquired the skill of writing, a taboo was maintained against putting down in writing their religious lore.”

⁶⁶ Caes. *B Gall.* 6.13-14; D. S. 5.31.2-5: εἰσὶ δὲ παρ’ αὐτοῖς καὶ ποιηταὶ μελῶν, οὓς Βάρδους ὀνομάζουσιν. οὗτοι δὲ μετ’ ὀργάνων ταῖς λύραις ὁμοίων ᾄδοντες οὓς μὲν ὕμνοῦσιν, οὓς δὲ βλασφημοῦσι (“And among them are also poets of music, whom they call Bards. And these, singing to instruments like lyres, make songs of praise and blame”). On the strength of the celtic bardic tradition as late as the seventeenth century, see further Watkins (1995), 76ff.; Ahl (1991) 136 and n. 14; for the sources used by Caesar and Diodorus, as well as other ancient testimony, see Rankin (1987), 272-276 *et passim*.

⁶⁷ Nagy (1974), 15ff.

⁶⁸ Bartók/Lord (1951), 4, 52-6; 60; cf. Wiora (1959), 203.

less restricted in scope.⁶⁹ In his seminal work on the existence of pre-pentatonic 'tonal systems', Wiora (1959), expanding on Bartók's hypothesis, showed that songs of limited melodic compass were to be found, not merely in the folk traditions of Europe, but throughout the world, whether living or fossilized. In the majority of cases, a close relationship existed between melody and speech contour,⁷⁰ and this led him to conclude that speech-song had once been a universal or near-universal phenomenon. Both qualities he attributed to the earliest phase of human musical activity.⁷¹

- 3.22 If Indo-European melodic practice was originally connected with tonal accent, some eventual dissociation of the two would have been unavoidable in the daughter cultures, since this accent has itself proven to be an evanescent feature. Pitch-accent is, however, still preserved in Serbo-Croatian, playing a part in the singers' melodization, along with a body of stereotyped melodic formulae.⁷² What role the tonal accent played in the creation of these formulae is unknown, yet it may have left its mark in peculiarities of melodic intonation which, while being subsequently conditioned by the diatonic scales of Western art music, owe nothing to them in origin. In such singing, the 'same' note will often vary widely.⁷³ Because of this, it is impossible for us to speak of a 'tone-system', since, strictly, the musical tone is by definition a single, stable pitch—deriving in this sense from *τόνος* as *τάσις* (cf. 2.20, 4.33). At the same

⁶⁹ But this is not to yield to an evolutionary view of melody which regards "one-, two-, three-, and more-note systems as corresponding to successive historical periods"; for a refutation of this outmoded view, see Wiora (1959), 185 and as a whole.

⁷⁰ Wiora (1959), 189 and quoting Hornbostel: "The duality of pitch, rising and falling by one step, is in primitive music obviously related to accent. 'The singer gives way to the natural tendency to sharpen or flatten the note simultaneously as it grows weaker or stronger.' It is more natural to change the level in such a manner than to maintain it, that is to repeat the note continuously from beginning to end of a song."

⁷¹ Wiora (1959), 203f.: "[Such narrow melodies] are, obviously, more ancient than pentatony. They belong to the most ancient kind of tonal systems known to us, and, what is more, to the most ancient that ever existed; this can be inferred by systematical considerations . . . They are evidences of the origin of music following the pre-musical sound . . . Ancient forms, that were to become blocks and backbones, shine here in the archaic purity of their origin."

⁷² Lord (1960), 37f.

⁷³ Wiora (1959), 200: "If the pitches intoned are measured in cents, the number of cent values obtained may often be very high, while the number of 'degrees' conceived still remains very small."

time, it is clear that this variable intonation is intentional and does form a coherent 'system' of some sort.⁷⁴ This unique intonation of Serbo-Croatian heroic song, still uninfluenced by European art music at the time of Parry's fieldwork,⁷⁵ might preserve elements of the ancient pitch accent to which the pan-Slavic melodic language as a whole originally answered. The phenomenon of broad musical unity over great geographical stretches is well illustrated by South Slavic poetic diction, which is a composite of Bosnian, Croatian, and Serbian dialectal forms. As with Homeric diction, the singer mainly employs his own dialect, but there are many formulae which carry with them archaic or alien forms.⁷⁶

- 3.23 As to ancient Greek heroic song, its melodic dependence on accent may be inferred from the fact that peculiarities of Homeric accent and pronunciation were preserved in the rhapsodic tradition long enough to receive the attention of Hellenistic grammarians; furthermore, the available fragments of notated music suggest that, unless prevented by strophic responsion, even Greek melody of the Classical period and later has a marked tendency to follow the contour suggested by word accent.⁷⁷ Indeed, a kind of accent-melody was addressed by Hellenistic literary theorists, who seem to have treated 'euphony' as a formal art; Philodemus' refutation shows that the issue was still alive in the first century B.C., as do the accents inserted in parts of the text by the unknown owner of the papyrus.⁷⁸ Thus, the evidence does in fact indicate an art of accent-melody for Greek epic song. Given the identifiable continuity of Indo-European poetic tradition throughout the daughter cultures, it remains to my mind quite conceivable that core elements of an ancestral vocal art should have persisted—in the broadest terms of course—and that Homer represents one heir to this. On the strength of this alone it should be necessary to explain the presence of heptatonic melodies in Greek music of the Archaic period, even without the traditions about Terpander. It is the seven-stringed lyre, and not the four-voiced song, that requires explanation.

⁷⁴ Bartók/Lord (1951), 4: "These deviations, since they show a certain system and are subconsciously intentional, must not be considered faulty, off-pitch singing. This is the essential difference between the accidental off-pitch singing of the urban amateurs and the self-assured, self-conscious, decided performance of peasant singers."

⁷⁵ Bartók/Lord (1951), 4.

⁷⁶ Foley (1999), 76f.

⁷⁷ West (1981), 114; (1992), 198-200.

⁷⁸ Philodem. *Poem.* 1.93-4. See Janko (2000), 84, 298-301.

- 3.24 The Slavic material proves that Greek song could easily have retained its ancient character into the Dark Age. The Vedic tradition, no more ancient than Slavic or Greek oral composition *in origin*, was effectively arrested at a very early stage in its development—a millennium and a half earlier than the date hypothesized for a common Slavic spoken language⁷⁹—and handed down subject to the most rigorous and centralized conservation that the priests could achieve. This provides an important diachronic anchor for Indo-European poetics, with or without accent singing as original. Serbo-Croatian heroic song, on the other hand, like Greek epic down through the Archaic period, has continued its slow, generational development, without restriction, into modern times. On an absolute timetable, then, the Homeric art falls between the dates for which ancient Indo-European attributes are attested in the parallel subtraditions.
- 3.25 Yet what supports the notion of an ‘absolute timetable’ when it comes to the development of a melodic art? It would be necessary to suppose that the two basic musical elements of the Indo-European tradition, metrical and melodic, evolved in close company, at roughly the same rate, and both subject to the same conservative transmission which preserved the vestiges of metrical kinship: for it is the metrical data in the first place which guarantee a recognizable Indo-European character to the Greek subtradition at the period in question. But what would prevent the melodic and metrical elements from evolving at different rates? After all, we find melodies of octave scope in Greece over two thousand years ago, while still-extant Slavic melodies preserve traces of the ancestral tradition.
- 3.26 Moreover, even if Greek αοιδή was the sort of narrow-range speech-song proposed, was Greek music like this as a whole? One might suppose that the non-heroic songs of the same period—all unattested, and only alluded to by Homer—used melodies of greater scope, while epic singing survived as a sacred and ancient tradition, as it certainly was by the Classical period. Vedic song might provide a parallel, existing alongside the Saman chant, which used the text of the *Ṛgveda* but was more recognizably melodic—i.e. more than a simple stylization of the words’ pitch accents, and exceeding at times a sixth in range. The beginning of Saman chant must have been before the Vedic hymns received their finished form.⁸⁰ Conversely, the

⁷⁹ Old Church Slavonic, with records going back to the ninth century A.D., can be taken as a close representative of a common Slavic language: cf. Szemerényi (1996), 11.

⁸⁰ Fox-Strangways (1914), 249 n. 2: “There is nothing to show that the [*Saman*] chants are later than the words [of the *Ṛgveda*]; in fact, since *Samans* are often mentioned in the *Ṛgveda* there is a probability, beyond the intrinsic likelihood, that they are older.”

development of wider melodic range—if this was in fact a secondary innovation—did not prohibit the continued existence of more ‘archaic’ melodic styles, for subpentatonic melodies of the type Wiora observed as being global are well documented in India today. These so-called tribal melodies fall outside the elaborate taxonomy of classical *raga*, which span for the most part a range of at least an octave.⁸¹ The distinction between ‘urban’ and ‘rural’ style seems to have been made already in antiquity by Bharata;⁸² if this is right, the contrast will not have been with *raga* per se, which attained to theoretical primacy at a date considerably later than the *Nāṭyaśāstra*.⁸³ It is not surprising, even at this early date, to find an awareness of the divergence of art music from a more universal and ancient ‘folk’ style. Indeed, a departure from such a conservative practice would seem to demand some historical acknowledgement, like the Terpandrian tradition. The dichotomy provides an interesting parallel to the emanation of diatony from the cities outwards in the Balkans, documented by Bartók (see below).

- 3.27 Once this possibility is allowed, what limit is there to the antiquity of such stylistic co-existence: might there not have been such complexity at the time of Indo-European unity? Under what conditions would melodic compass have changed, especially if one rejects a progressive evolution towards heptatony? Could this have happened from within the tradition, or only in response to some external influence? Clearly, this raises questions about the nature and transmission of melody—a word which I have used lightly until now. But as we understand it—a fixed, repeatable tune—the word is misleading and at least partially, perhaps wholly, irrelevant. As we have seen (2.31-32), musical μέλος is not found in any of Homer’s numerous performance scenes; thus, even if the word could have had a musical sense in his time, it was clearly unessential for the style of song he wished to describe. Furthermore, in the Indo-European and

⁸¹ Bhattacharya (1968), 46ff.

⁸² Bhattacharya (1968), 46ff. The dating of the *Nāṭyaśāstra*, a treatise on all aspects of dramaturgy, including music, is uncertain. Ghosh (1934) believed it to be the work of one hand, written in the second or third century A.D.; though isolated verbal features did suggest the preservation of earlier sources; he was reluctant to date this material before the first century B.C. Srinivasan (1980) has since argued persuasively that the work is in fact a hopelessly jumbled and inconsistent compilation; Rocher (1981) has examined the complexity of its textual history. In any event, at least some of the musical terminology must be considerably more ancient than the *Nāṭyaśāstra* as we have it, since musical references in older, non-specialized works imply a formal theoretical tradition: cf. Tarlekar (1975), 161; Fox-Strangways (1914), 114.

⁸³ On the relative lateness of the *raga* system, see Widdess (1995).

other epic traditions, words for 'song'—e.g. Homeric αἶδεν—are frequently ambivalent as between "sing" and "tell",⁸⁴ and this suggests a fundamental subordination of 'melody' to words. All recorded epic melody is simple and repetitive, since the demands of composition-in-performance force the singer to give most of his attention to choice of word and phrase. In the Serbo-Croatian material collected by Parry and Lord, there is an inverse relationship between richness of poetry and complexity of tune. Avdo Međedović, for example, regarded by Parry and Lord as the last singer of Homeric stature, was a *guslar* of middling ability who was sometimes reduced to running his bow over the string in a drone as he unleashed great torrents of poetry.⁸⁵ Here we see the essentially rhythmic function of the epic singers' instrument, despite its participation in the realm of pitch. The primacy of poetic invention thus operated as a sort of balancing mechanism to check the elaboration of melodic language. The Indo-European singer of tales was simply not a melodist as we would understand it.

- 3.28 If the metrical model presented above is valid, and if Indo-European art song involved the melodization of pitch accent—or if its melody answered to any aspect at all of the language—there are several consequences. Where rhythm and melody are drawn from internal characteristics of word and phrase, we must suppose a pattern of melodic evolution analogous to the metrical. Any given combination of words would have a unique pattern of pitch accents to be navigated melodically according to some standard strategy, while allowing for the 'tactical' variations of regional subtraditions and the individual singer. The conventions which governed these maneuvers might be called 'melodic syntax', depending as it would on the syntax of words. A collocation which stood the test of time, fixing its place in the poets' repertoire, would be accompanied by a melodic fragment which was also more or less formulaic, to be absorbed by a young singer as he learned the words and rhythm of each formula. Such a fragment comes a step closer to our notion of melody as a unique and memorable pattern of pitches. The sum total of these fragments would comprise a melodic 'vocabulary' which would follow the same the cycles of growth and decay as the diction and metre.⁸⁶ Yet during composition-in-performance, the melodic and metrical will have unfolded independently; for each new phrase which took advantage of an established metrical cliché would be accompanied by its own accentual pattern. The counterpoint of tonal and metrical modulation provides an ever-different

⁸⁴ Lord (1962), 180ff.; West (1981), 113.

⁸⁵ Lord (1980), 57, 68.

⁸⁶ For the concept of musical styles being governed by syntactic and morphological 'rules' and analyzable through a modified linguistics approach, see e.g. Sloboda (1985).

'accompaniment' to the tale being sung. It was this hypnotic interplay in Serbo-Croatian heroic song which fascinated Bartók in the end.⁸⁷

- 3.29 The metrical parallel suggests that a limited number of melodic phrases could emerge, and that these would eventually drive the process of oral composition, and no longer be driven by it. Thus, the South Slavic *guslar*, though his formulaic diction is continually varied, uses a fixed set of melodic formulae in a single metre. To press the analogy of metre and melody, we must suppose a state of the world—at least for Indo-European oral composition—in which melodies were not sung to certain fixed pathways such as those offered by piano scales or the strings of a lyre. Such melodic routes would result in time, a 'tonal' system derived through the ritualization of speech as song.⁸⁸
- 3.30 This model of melodic evolution produces a continuum of fixity, ranging from the determined melodic fragments of traditional formulae to the fluid customs by which non-formulaic phrases would be navigated in performance. It also follows that each of the subtraditions would hold in common a different body of melodic fragments and syntax, varying directly in proportion to the culture's overall divergence from its parent and sisters. Accordingly, the melodic evolution of the Indo-European traditions should show patterns of synchronic and diachronic change closely akin to those of the associated languages. This is borne out by Bartók's study of melodic distribution, which shows patterns precisely analogous to those of dialectal dispersion. In the Balkans, the 'same' melody is found in various regions, most easily recognized by features such as section structure, metrical character, ambitus, and melodic contour. The actual 'scale' or pitch-set of each proved unhelpful to Bartók, who found it difficult to decide when two melodic variants were distinct enough to warrant classification as separate tunes. Sometimes, when tunes which had been accepted as

⁸⁷ See Lord (1960), 37f. I was privileged to hear some this material in October 1997, by the kindness of M. L. Lord and M. Kaye. Selections from the Parry Collection have finally been made available with the reissue of Lord's *The Singer of Tales* (Cambridge, Mass., 2000).

⁸⁸ Wiora (1959), 203: "When we make music or listen to it, we have the keyboard, the tonal system, the totality of our scales in our minds; these make up the area on which we move, and of the whole tonal area which we realize in its entity, we let now one now another ring out. In ancient singing, on the contrary, the dividing lines between notes and the system imagined against it existed but in the kernel. The usual systems or the 'succession of notes used' in this singing are actually scales, i.e. keys, but in a broader sense, [from] which we must exclude everything that is added to it by the music of great civilizations".

variants were ranged by degree of variation, the first of the series could no longer to be heard as a variant of the last, but was a strikingly distinct melody.⁸⁹ The same phenomenon has been observed in India—where the elaborate classification of *raga* is concerned with just this—as well as England and elsewhere.⁹⁰ Propp observed the effect in the distribution of Russian fairy-tales.⁹¹ In song dispersion, such scalar differences within the ‘same’ tune might fairly be seen as ‘regional pronunciations’, directly analogous to dialectal differences in the spoken language. The closer the relationship between speech and song, the more these patterns will present a synchronic view of the Indo-European musical tradition in dispersion.

- 3.31 Clearly, such patterns must have existed in ancient Greece, and may be at the root of the musical νόμος. The word, which in a non-musical sense means ‘custom’ or ‘common law’, may also designate a musical entity which was open to interpretation and variation, but at the same time uniquely recognizable.⁹² Compare the memorable duel in Stevenson’s *Kidnapped*, where each piper plays variations, known only to him, of a tune known by both; or the friendly competition set up by Parry between Avdo Međedović and his colleague Mumin Vlahovljak.⁹³ The use of νόμος to describe birdsong might support this interpretation. When Alcman claims to know all the νόμοι of birds, the human musical νόμος is clearly implied; indeed, this fragment is the first witness for both uses of the word, giving very early authority to the Greeks’ recognition of the analogy.⁹⁴ Elsewhere Alcman explicitly compares human and birdsong,⁹⁵ and Hesiod attests a musical sense to νόμος in his description of the

⁸⁹ Bartók/Lord (1951), 15, 34.

⁹⁰ Fox-Strangways (1914), 151ff.

⁹¹ Propp (1975), 114: “The distinction between theme and variant is totally impossible. Here there can be only two points of view. Either each alteration gives a new theme, or all tales provide one theme in diverse variants. As a matter of fact, both formulations express the same thing: the entire store of fairy tales ought to be examined as a *chain* of variants.”

⁹² See e.g. West (1992), 215-7; the testimonia for νόμος are assembled by Grieser (1937).

⁹³ Lord (1980), 68.

⁹⁴ Alcman. 40 *PMGF*; cf. 39; Alc. fr. 307c (Voigt)?; Pratin. fr. 1.5 (*PMG* 708); Ar. Av. 210, 1346; etc. Barker (1982-9), 1.250 rightly argues that the classical writers were largely speculating in their discussions of the Archaic νόμοι, and that Alcman’s usage is not technical in the same way; but the literary evidence is sufficient to show that the musical νόμος existed in *some* form throughout the Archaic period; cf. Chadwick (1996), 206f.

⁹⁵ Alcman. 1.100f. *PMGF*; 39; *Anth. Pal.* 7.19.1f. (Leonidas Tarentinus), which calls Alcman τὸν ὑμνητῆρ’ ὑμεναίων / κύκνον (“the singer-swan of wedding songs”); cf. *h. Hom.* 19.16f.; *Anth. Pal.* 9.184.9 (Anon.).

Muses singing the laws (νόμοι) of the gods.⁹⁶ But the association of birdsong with the lyre was already very ancient, being attested in the Mycenaean period by paintings and instrument design,⁹⁷ and obliquely in Homer's archer-citharist simile, where Odysseus' bow string is said to sing like a swallow.⁹⁸ The derivation of both νόμος and νομή ("pasture") from νέμειν ("to distribute")—if this is correct⁹⁹—accords well birds' use of song to delimit territory, a function which combines the musical and 'legal'. Moreover, though each species has a single and distinctive call, there is a continuum of variation throughout the range.¹⁰⁰ It seems likely therefore that the Greeks would have been aware of the 'same' song being varied by region, just as they were familiar with the various spoken dialects.

- 3.32 We get frequent references in later literature to individuals, such as Terpander or even Timotheus, who composed νόμοι. At first sight, this seems to contradict the identification of the νόμος as a traditional tune in dispersion. Yet in the melic revolution, with its emphasis on individual innovation, the word's older meaning would naturally have evolved alongside the musical changes. The waning of the heroic song tradition, as represented by the increasingly classical status of the *Iliad* and the *Odyssey*, clearly attests the effacement of traditional distribution patterns. Of course, νόμος could be quite properly applied to a piece by Timotheus once it had been adopted by other musicians, given a musical culture in which broad interpretive powers were granted to the individual musician. In the Archaic period, especially, there must have been a certain amount of such freedom. The songs of Sappho, for example, were widely known and survived in recognizable form into the Classical period, yet the hypothesis of distribution in fixed form through notated 'sheet music'

⁹⁶ Hes. *Th.* 66f.: μέλπονται, πάντων τε νόμους καὶ ἡθεα κεδνὰ / ἀθανάτων κλείουσιν. Ps.-Arist. *Pr.* 19.28 offers the explanation that prior to literacy laws were sung, and reports that this was still true among the Agathyrsi of Thrace; Plato develops the association of the legal and musical νόμος extensively at *Lg.* 656c-660c, 799e; cf. *Phdr.* 278c; cf. Mart. Cap. 9.926 *Graecarum quippe urbium multae ad lyram leges decretaque publica recitabant*; Clem. Al. *Strom.* 1.16.78: καὶ τοὺς Λακεδαιμονίων νόμους ἐμελοποίησε Τέρπανδρος.

⁹⁷ Anderson (1994), 4-7, 12f.; Younger (1998), plates 13 (Pylos fresco, Chora Museum, LH IIIB2-C), 14.1 (Pyxis, Chania Museum 2308, early LM IIIB).

⁹⁸ Hom. *Od.* 21.406-11, cited in 5.14.

⁹⁹ Chadwick (1996), 206f. has recently questioned this derivation, "and even if the connexion is proved, more research is needed on the history of the noun".

¹⁰⁰ This was pointed out to me by Dr. Richard H. Backus, Woods Hole Oceanographic Institution (communication).

is problematic in the extreme. Here, perhaps, the traditional art of melodizing poetry was still operating somehow within the new melic music—like the epic-melic fusion of the Homeric *Hymns* (cf. 2.30, 5.0)—so that, throughout the Greek world, trained musicians could give a musical performance directly from the text, if the μέλος or ἁρμονία were specified. If this is correct, it is strong evidence for the early existence of a broadly unified Hellenic melodic art, of which epic singing was one exemplar.

- 3.33 This picture of ‘melodic dialectology’ might also illuminate two further aspects of later Greek music. The first is the existence, attested as early as Alcman (cf. 2.31), of μέλη (later ἁρμονίαι) distinguished by region: Phrygian, Lydian, Dorian, Ionian, Cretan, Aeolian, and so forth. The use of such names to describe the octave species is a development of the later fifth century, perhaps one contribution of Eratocles,¹⁰¹ and here it is right to suppose some systematization of early Greek practice through the regularizing effects of diatony (cf. 1.4, 1.12). Again, this does not exclude the possibility that the diatonic octave species were also known throughout the Archaic period (cf. 1.12); prior to Eratocles they may have had no names, or other names—such as Terpander’s sevenfold division of the citharodic νόμος (cf. 7.25, 10.37). Such regional styles are likely, at least in part, to have been conditioned by “the isolationism of the Dark Age”,¹⁰² though ‘Phrygian’ and ‘Lydian’ may document, however distantly, the exchange of musical ideas with these cultures (cf. 1.22, 2.5, 2.11, 2.15). Though there is a continuum of variation even within a spoken dialect, nevertheless there must be enough distinctive features found throughout the dialect area to warrant its unique classification. The regional metrical traditions are likewise marked out by conventions proper to each.¹⁰³ The same must have been true of the otherwise continuously varying melodic dialects, of which the early νόμοι were expressions.
- 3.34 This is consistent with what is known about the education of singers in the Indo-European traditions, whether we suppose for the Greeks formal, regional schools of song like those attended by the Celtic bards, travelling αοιδοί such as Terpander and Alcman who might effectively impose certain standards on many communities during the course of their travels, or a combination of the two—recalling that Terpander was said to have established a musical ‘school’ in Sparta (cf. 2.38), and the Lesbian γένος may have been similar. The legendary *guslar* of South Slavic tradition was also

101 West (1992), 227; on Eratocles, see further 7.0.

102 West (1973), 181.

103 See West (1982).

remembered as travelling widely;¹⁰⁴ his comprehensive repertoire and reputed influence over singers everywhere symbolizes the broad unity of the tradition. The professionalism of Greek musicians is well illustrated by a host of performing names, historical and legendary—Araros the son of Aristophanes, Chairis, Choricus, Chorocles (father of Phrynichus?), Cycleus (father of Arion), Demodocus, Encomius (father of Pratinas?), Epicharmus, Eumolpus, Eunomos, Harmonides the aulete, Molpis, Phemius, Philochorus, Polymnestus, Polyterpus, Spendon of Sparta, Stesichorus, Terpes, Terpsicles—not to mention both Homer¹⁰⁵ and Terpander himself. These may have been taken as stage names by each, or given at birth by musician fathers intending to pass on their trade. Thus Demodocus and Phemius cannot be dismissed as fictitious merely because of their names; they may once have been renowned performers whose memory Homer honored for reasons of professional courtesy. In the Indo-European cultures, singers often formed a hereditary caste within the aristocratic stratum.¹⁰⁶ In Sparta, at least, αὐλός-playing was passed from father to son.¹⁰⁷ Serbo-Croatian heroic song still seems to have been quasi-hereditary in the early twentieth century.¹⁰⁸

- 3.35 This inherited melo-dialectal variation may have been one tributary to the Aristoxenean genera and their diverse shadings (cf. 1.24, 2.35). In cases of musical syncretism, it is common to find that two styles, after coexisting for some time, may coalesce into a distinct practice which features the strongest elements of each.¹⁰⁹ In the case of the African-American syncretism, we find the imposition of inherited ‘blue’ notes on European diatony. Likewise, the Terpander fragment suggested a juxtaposition and segregation of two musical styles in the early phase of seven-stringed music (cf. 2.29). By the end of the Archaic period, however, and probably well before (cf. 7.39), the ‘clear’ diatonic tunings were being ‘colored’ by musicians like Lysander of Sicyon, who introduced χρώματα εὐχρῶα (“well-shaded colors”).¹¹⁰ We might then see Aristoxenus as the first ethnomusicologist, making careful measurements against a diatonic grid through the application of Aristotelian methods of classification. The

¹⁰⁴ See Foley (1999), 52f.

¹⁰⁵ Nagy (1979), 297-300.

¹⁰⁶ Watkins (1995), 71

¹⁰⁷ Hdt. 6.60: οἱ κήρυκες αὐτῶν καὶ αὐληταὶ καὶ μάγειροι ἐκδέκονται τὰς πατρώϊας τέχνας. καὶ αὐλητῆς τε αὐλητέω γίνεται καὶ μάγειρος μαγείρου καὶ κήρυξ κήρυκος.

¹⁰⁸ Lord (1960), 22.

¹⁰⁹ See Nettl (1985), and below.

¹¹⁰ Philoch. *FGrH* 328F23 = Ath. 14.637f-638a. See further 7.33.

musicians' instincts must still have been alive and well for him to be able to make such nice distinctions; for the Aristoxenean measurements do not seem arbitrary or even particularly approximate.¹¹¹

- 3.36 It is against this continuum of melodic change that the fossilized ceremonial songs observed by Bartók and Wiora, and alluded to by Homer, must be understood. If each accompanied some ritual—a complex of actions resistant to significant change—the ceremonial song would more or less drop from the ongoing process of formation and reformation which characterizes a tradition of oral-composition. Having achieved perfection, it would not be recomposed on each occasion, and would endure as a snap-shot of the music-stream in flow, becoming what we understand as melody: a fixed tune. Kinship between languages is most easily revealed by those words which have preserved their ancient meanings the longest; those which, designating something basic and unchanging, had themselves no reason to change. Likewise, it is through the ceremonial songs of the cognate subtraditions that the character of Indo-European song must be established, as these are the only diachronic data available. While we must suppose that e.g. the harvest songs of each tradition will be as unlike-sounding as the respective languages, a continuous channel of preservation for the 'form' itself requires no imagination.
- 3.37 The dependence of metre and melody on poetic language, if it is right to suppose this as characteristic of Indo-European song, would go a long way towards explaining the seemingly analogous phenomena of linguistic and melodic distribution. The singer of oral-formulaic speech-song requires a fluency which seems as much linguistic as musical.¹¹² As with language, the handing-down of such an art is conservative in the extreme. A new generation does not devise a new language, but learns that of its parents. Likewise, the accomplishment of the younger singer is in the emulation of the elder, and this professionalism—in the case of South Slavic heroic song, the

¹¹¹ See Winnington-Ingram (1932).

¹¹² Lord (1962), 184: "As a boy he hears the old men sing, and he absorbs the stories and becomes acquainted with the phraseology and language of the poetry and with its rhythms. They become a part of him and his young mind begins to remember the tales and to form his thought in the pattern of the song. The process in the early stage is as unconscious as a child learning to speak, when he first listens to the sounds his elders are making"; cf. Lord (1960), 22.

legacy of minstrelsy in the medieval courts—"may be of great moment in maintaining a tradition".¹¹³

- 3.38 Poetic diction, while it is in constant flux alongside the spoken language, changes in some ways more slowly, protected as it is by the ritual of performance and by professional convention. Many archaic words and *hapax legomena* are preserved in Homer, the precise meanings of which the αοιδός himself may not have known, feeling only "the atmosphere and the fragrance, and of course the actual magic, that clung about them."¹¹⁴ The very purpose of the tradition was conservation: the singers kept alive the memory of the past, the deeds of old heroes, and the technique and musical lore of the ancient teachers. Thus Mnemosyne (Memory)—the mother of the Muses—was deified by the singers, personifying the unfathomable depths of musical tradition. To break with the technique of one's elders would destroy the medium which preserved these κλέα ἀνδρῶν. This mission of conservation was most rigorous in Vedic tradition, where its success over the millennia is easy to measure. Here too, however, unintentional, cumulative change is shown by the disagreement of ancient theory and current practice.¹¹⁵
- 3.39 Thus the melodic element of an Indo-European musical tradition could well have evolved in strict company with, and no faster than, the metrical element, poetic diction, and the language itself. In each case this evolution was so conservative as to allow only unintentional and cumulative change—paradoxically through the contributions and influence of individual singers—to the tradition's essential features. This is the essence of historical language kinship, for despite the huge differences between the Greek, Slavic, and Indic languages, the proven kinship between them, and the essential sameness which lurks just beneath the phonological detritus, is more striking still. In Indo-European metrics, the basic distinction between long syllables and short is one constant, and certain fundamental patterns survived in recognizable form. On the basis of the Greek and Slavic parallels, it seems possible that some sort of accent- or word-melody may have been an equally stable part of Indo-European oral composition.
- 3.40 But was limited melodic compass one of the essential qualities of Indo-European song? This would follow on the hypothesis of accent-melody, since, according to

¹¹³ Lord (1962), 181f.; for the young singer's training, Lord (1960), 20-29; for the singer's status in the medieval courts, Lord (1960), 16.

¹¹⁴ Murray (1927), 42f.

¹¹⁵ See Fox-Strangways (1914), 246f.

Dionysius of Halicarnassus, the Greek pitch-accent spanned an approximate (i.e. non-resonant) fifth.¹¹⁶ If so, under what conditions would melodic range change? Why do we find the Greeks using heptatonic scales in the Archaic period, but vestiges of narrow and ancient melody in pockets of the Balkans today? Bartók's research provides the key. As he discovered, songs with the archaic pan-Slavic qualities were distributed more densely in the territories where Turkish influence had been minimal; by contrast, melodies of wider range were found in areas, such as Bulgaria, where there had been active Turkish settlement for some centuries.¹¹⁷ A second and more erosive force has been European art music, flowing outwards from the cosmopolitan cities. In areas less subject to this diatonic stimulus, songs of restricted melodic scope persisted, albeit dwindling steadily. This is a good illustration of how a resonant tone-structure may serve as an international musical standard, a 'metric system' to which archaic intonation may be assimilated (cf. 2.8). The same phenomenon has been observed in modern Greek folk music.¹¹⁸

- 3.41 With the expansion of melodic range, the possibilities of tonal contextualization greatly proliferate. The traditional melodies of the Balkans had often come to be heard as fragments of diatonic scales, their ancient tonal contexts forcibly reinterpreted against the bimodality—major and minor—of Western art music.¹¹⁹ At the same time, syncretism involves mutual adjustment. These diatonic scales have been adapted to local needs, whereby typically Slavonic 'accidentals' have been superimposed on the diatonic substrate to create such syncretic pitch structures as the octatonic scales used by Bartók and Stravinsky. I know of one Rumanian melody which uses the sequence D-C#-C-A—identical to an ancient Greek chromatic tetrachord. These parallels are important for understanding the Greek music of the post-Orientalizing

¹¹⁶ D. H. *Comp.* 11 (126.3f. Roberts): διαλέκτου μὲν οὖν μέλος ἐνὶ μετρεῖται διαστήματι τῷ λεγομένῳ διὰ πέντε ὡς ἔγγιστα ("Now the melody of speech is measured by one interval, closest to that which is called a 'fifth'"). It is important that the interval is made approximate: it divorces pitch accent from the tonal intonation proper to resonant intervals. Thus, any attempt to recite Greek language or poetry by modulating the voice woodenly between musical intervals does no justice to the subtle tonality implied here.

¹¹⁷ Bartók also noted the difference between rural and urban Turkish styles. Both use melodies of wide scope, but the peasant style is of Central Asiatic origin, while the urban is heir to the Near Eastern tradition of octave scales: see Bartók/Lord (1951), 55 n. 45. The latter surely goes back to the heptatonic tradition of Mesopotamia.

¹¹⁸ Beaton (1980), 9.

¹¹⁹ Cf. Bartók/Lord (1951), 59-60; Wiora (1959), 203.

period. South Slavic song demonstrates the self-sufficiency of ancient oral composition, proving that there was no evolutionary imperative towards an expansion of melodic range, the 'perfection' of melodic intonation in conformity with resonant tone-structures, or even the crystallization of accents into precise melodic pitches. Limited compass and vagrant, non-diatonic intonation were, broadly speaking, perfect and unevolving traits within the evolving tradition, invulnerable in the absence of the external stimuli which might induce mutation.

3.42 If the Slavic parallels are valid, the melodic tradition of those Indo-Europeans who came to Greece should have pursued its course until deflected by similar circumstances. Accordingly, the expansion of melodic compass, the standard use of a seven-stringed lyre, and the primacy in later theory of a resonant tone-system, must be explained by the Greeks' contact with a cultural sphere in which these things were standard. Mesopotamian diatony, as we have seen, was the core of such a tradition, already constituting a system of great refinement—one might say completion—and disseminated widely throughout the Near East. If this musical culture was relatively stable throughout its range, as the texts indicate (cf. 1.6), the Greek and Indo-Iranian encounters with the Mesopotamian musical sphere involve a constant which may help to explain such Greco-Indian parallels as those noted by Fox-Strangways (1914). For the Greek Orientalizing period itself, the relationship of Cyprus and the Aegean periphery to the central and expanding superpower of eighth-century Assyria—carrying the cumulative weight of a millennium and more of Mesopotamian culture—might be compared with the rapid modification of hundreds of ancient musical traditions which is going on today, due to the 'global village' effect.¹²⁰ The Balkan material studied by Bartók is itself a good illustration of this. Apart from the analogous cultural dynamics of the ancient and modern situations, diatony features in each case as an essential musical catalyst.

3.43 As I see it, then, the Terpendrean tradition documents the Greek musical experience of the Neo-Assyrian period. The model presented in this chapter is reductive, of course,

¹²⁰ See especially Nettl (1985), 20, who distinguishes two broad levels of response, which give rise to a wide array of syncretic phenomena. "Modernization" is "the incidental movement of a system or its components in the direction of Western music and musical life, without, however, requiring major changes in those aspects of the non-Western tradition that are central and essential." "Westernization" is "the substitution of central features of Western music for their non-Western analogues, often with the sacrifice of essential facets of the tradition". If one substitutes 'Oriental' and 'Orientalization', many of the cases surveyed by Nettl offer stimulating ways of thinking about musical change in the Greek Archaic period.

and pre-Orientalizing Greek music must have been more varied than it allows. The tradition of oral composition, to which the model is most relevant, was but one element of a larger musical culture; the Homeric art was but one subtradition of this, descending from a specialized development of the Mycenaean period. It is essential to remember, however, that the hexameter derives from the same matrix as the lyric metres of Lesbos, and this strongly supports the idea of a unified musical tradition transcending generic distinctions. Likewise, Bartók was able to identify universal pan-Slavic characteristics—the same limited range and non-resonant intonation which I have proposed as characteristic of the Hellenic tradition. The fundamental problem in understanding Homeric song is that we simply do not know what it sounded like, and never will. All the same, it is safe to say that Greek music as a whole in the Geometric period conformed, in the most general terms, to a ‘system’ of its own which contrasted sharply with Near Eastern diatony, and that these disparate elements could form the basis of a lasting musical syncretism. Clearly, we cannot suppose that every expression of this musical culture followed the conventions of “four-voiced song”. Yet oral composition was central to this tradition, being both its high art music and a key instrument of cultural preservation. The Ionic epic τέχνη was, besides, the preeminent art-music of the eighth century, and the αἰδοί, as a professional class, would have been the principal adapters during a large-scale musical movement. Terpander’s juxtaposition of ἑπτατόνῳ φόρμυγι and τετράγηρυν αἰδάν thus brings into focus the principle musical forces involved in the melic revolution, and reveals two key elements of the Greco-Asiatic syncretism.

4.0 The Lyre of Orpheus: Palatial Music in the Bronze Age

- 4.1 We now have a tolerably clear picture of the τετράγηρυν ἀοιδάν which the Lesbian gleeman exhorted his audience to reject. Before considering the proposed Orientalizing syncretism of this music with the diatonic tradition of Assyria, there remains the chief obstacle to believing that Terpander—as a symbol for his time—could have ‘invented’ a ἑπτάτονος φόρμιγξ: the heptachordal, and sometimes octachordal, instruments which decorated walls, tombs, and vases in the Mycenaean and Minoan palaces.
- 4.2 The importation of specifically Mesopotamian cultural artifacts—and the exportation of Aegean ones—are best traced to either the Bronze Age or the Orientalizing period, the two times at which cultural contact between East and West was sufficiently intense and hospitable for such a transfer. One possibility might be to see the seven-stringed tunings of the Bronze Age as indicating early heptatonic inroads, while the three- and four-stringed instruments of the Dark Age show the continuation of the inherited Indo-European song style. The two coexisted, along with αὐλός-repertoire, various forms of ritual music, etc., in a larger musical culture, like the Vedic and Saman chants of ancient India (cf. 3.26). This was essentially Deubner’s (1929) solution (cf. 3.6).
- 4.3 But that picture does not take into account several factors which are impossible to dismiss. The transition from the Mycenaean period to the Dark Age, following the collapse of the palaces, was marked by a general decline of high culture. If one accepts the Dorian arrival to the Peloponnese at this time—a large-scale population movement remains the most widely accepted scenario on the basis of later dialect distribution, and Greek tradition itself¹—this would also constitute a ‘reversion’ to a more archaic—that is, pre-Orientalized—Hellenic culture throughout much of the Greek peninsula, just as the West Greek dialect group appears more conservative with respect to inherited Indo-European features.²
- 4.4 The usual view of the so-called Dark Age as a catastrophic interruption has recently been questioned, cultural continuity being stressed on the basis of persistent

¹ Th. 1.12, cf. 5.112; Hdt. 8.73; the other ancient testimonia are collected by Hooker (1976), 213-222. For the hypothesis that the Dorians were already present in the Peloponnese, see Chadwick (1976); Hooker (1976), 166-180.

² Hooker (1976), 163.

mercantile links.³ The archaeological record shows, besides palatial destruction, very little apparent discontinuity in Greek material culture,⁴ and this suggests *prima facie* the mutual adaptation of immigrants and indigenous peoples. And yet, to judge from the case of Messenia, post-palatial Greece experienced a massive population decline, perhaps by as much as ninety percent in some regions.⁵ There were also major demographic shifts, notably the Aeolic and Ionic migrations, probably in the wake of the Dorian movements.⁶ Likewise, the dialectal diversity of the Classical and Archaic periods, as against the relative homogeneity of Mycenaean, may reflect the disappearance of a unifying political entity.⁷ To some extent, however, this might be an illusion of the documents; with the exception of a few variant spellings, these are written in the dialect of the ruling class (see below), while significant regional differences would have gone unattested.

- 4.5 Nevertheless, simultaneous continuity and interruption cooperate to give a realistic explanation of the musical issues. The fall of the palaces must have occasioned a decline in those areas which flourished under their protection, including the art music which underlies the palace paintings and the registry of lyre-players among the palace personnel at Thebes (cf. 5.7). Most people, of course, had always lived in a Dark Age, if this is defined as the lack of palace luxuries. From this perspective, clearly, there must have been significant cultural continuity. We may assume the survival, in various forms throughout Greece and the Aegean, of the ancestral Indo-European song tradition,⁸ the very purpose of which was to guarantee such cultural continuity through the agency of deified Memory. The Slavic material, considered in the last chapter, shows that ancient traditions are most stubborn “in remote regions unaffected by international routes”.⁹ Thus the Arcadian dialect, with its Mycenaean affinities, survived in the inner Peloponnese,¹⁰ and it was remembered that this race was

³ See for example Morris (1992).

⁴ See e.g. Chadwick (1956), 48.

⁵ McDonald/Simpson (1972), 142f.

⁶ See Hooker (1976), 163ff.

⁷ Chadwick (1956).

⁸ For the assumption of regional poetic traditions in the Dark Age, and their Indo-European basis, see West (1988).

⁹ Wiora (1959), 183.

¹⁰ Ruijgh (1961), 208.

autochthonous.¹¹ It was the strong musical conservatism of this region that attracted the young Aristoxenus (cf. 2.37). The same phenomenon of isolationism might be found in the oral composition in dactylic metre which survived long enough to provide inspiration to Theocritus in the third century B.C. (cf. 2.36).

- 4.6 The fall of the palaces provides a plausible explanation for the disappearance of the seven-stringed lyre. The status of heptatonic music in the Greek Bronze Age could have been like that of Turkish melodies in the Balkans (cf. 3.40): a music of foreign inspiration, cultivated in cosmopolitan courts, and the property of a ruling class and its musicians. For the lyre is the only stringed instrument attested for the Mycenaeans, and was acquired, according to the common scholarly opinion, from the neighboring Minoans, whence it may be traced to Near Eastern archetypes.¹²
- 4.7 One might suppose that, after some centuries of practice, but still within the Mycenaean period, heptatonic music had made itself known beyond the palaces in various regions. The social position and mobility of the ἀοιδός could have provided a musical link between palace and village, uniting the two worlds in a common performance culture. Yet the inherited tradition of oral composition will have held a more central position across both the popular and aristocratic strata of society, being the preeminent art music at the Greeks' appearance in the Aegean sphere. In either case, the lyre of few strings, with its "four-voiced song", may be interpreted as a 'reversion' to an inherited musical substrate with its melodies of narrow scope and peculiar intonation, the primary function of which had been, since Indo-European times, to record what was worth remembering about the past for the people as a whole.
- 4.8 Of course, the presence of a heptatonic *koine* in the Mycenaean courts would not have excluded the concurrent performance of this inherited epic song, just as we find Phemius, Demodocus, and Achilles in aristocratic settings singing κλέα ἀνδρῶν, the deeds of heroes. While some musicians were undoubtedly sequestered in the palaces—perhaps Minoan professionals,¹³ or leisured experimenters whose music would not have been to the traditional taste of the wider populace—this cannot reflect Mycenaean musical life as a whole. Homer's portrayal of ἀοιδοί conforms with what

¹¹ Hdt. 8.73; X. *Hell.* 7.23 αὐτοῖς πατρὶς Πελοπόννησος εἶη, μόνοι γὰρ αὐτόχθονες ἐν αὐτῇ οἰκοῖεν; Paus. 8.1.4-5; etc.

¹² E.g. West (1992), 49; Maas/Snyder (1989), 2f.; Duchesne-Guillemin (1967), 239; contrast Anderson (1994), 6.

¹³ West (1992), 328.

is known of the Indo-European singer's social status. The "tribe of singers" (φῦλον ἀοιδῶν) was both exalted and popular, "for among all the people on the earth, singers are awarded honor and esteem" (πᾶσι γὰρ ἀνθρώποισιν ἐπιχθονίοισιν ἀοιδοὶ / τιμῆς ἔμμοροί εἰσι καὶ αἰδοῦς).¹⁴ It is likely, then, that the Mycenaean ancestor of Aeolic and Ionic epic was cultivated in the palaces in more rarified form than other strains of the inherited tradition practiced regionally—just as the Mycenaean dialect was that of the ruling class (see below and Appendix A). The carefully-depicted five-stringed instrument from Pylos (c. 1300)¹⁵ might then suggest the lyre's adaptation to inherited musical requirements well before the end of the period. It is impossible to know how faithfully Homer may preserve the memory of Mycenaean musical life. As Parry observed, the singers, though they appear in court scenes, seem not to belong to the household itself, but to the villages beyond.¹⁶ There too, of course, they would command great respect, being, like Demodocus, "welcome to the people". The disappearance of the palaces will have changed the singer's performance context, and it may be that Homer is describing the situation as he himself knew it. A Balkan parallel is the singing of Slavic epic in the courts of the Moslem pashas, although in Mycenaean Greece the members of palace and village belonged to the same larger culture; a better analogy is the medieval Slavic minstrel, whose courtly status was ended by the Turkish conquest, not to reappear after they had been expelled.¹⁷

- 4.9 Already in the Mycenaean period, epic song was an ancient tradition, doubtless with same proportion of archaic features that we find, *mutatis mutandis*, in and after Homer. Dactylic rhythm in pre-hexametric form must have played some role, for the formulas fossilized in Homer are themselves often dactylic.¹⁸ For what it is worth, some sources attribute the hexameter to Orpheus,¹⁹ and the Orphic verses are commonly in this metre. More tellingly, Homer preserves inherited Indo-European

¹⁴ Hom. *Od.* 8.479ff.

¹⁵ See e.g. Anderson (1994), 13.

¹⁶ Parry (1987), 456: "Demodocus, like Phemius, does not seem to have been an actual member of the household in which we see him singing, but rather a member of the community who through his art has won a certain place in the life of the household, that is to say, there is no evidence that the singers in question were men whose sole concerns and means of livelihood was their song, or that they were attached exclusively to a single household"; cf. Lord (1962), 181-4.

¹⁷ Lord (1960), 16.

¹⁸ Horrocks (1997), 201ff.

¹⁹ See Kern (1922), 31.

syntactical features, such as tmesis, which are already obsolescent in Linear B.²⁰ This lets us believe, as indeed we might expect, that the inherited Indo-European practice of singing κλέα ἀνδρῶν was not in the Bronze Age merely “welcome to the people” but, due to its great antiquity, occupied a position of honor in the palaces alongside any more cosmopolitan form of entertainment.

- 4.10 At the same time, however, one may suppose that the palatial environment, with its abundance of leisure for the musical and foreign ideas for the inquisitive, would have engendered a certain amount of cultivated musical thought distinct from the interests of the traditional αἰδώς. This could have included, but of course not been limited to, current Near Eastern ideas. The Minoans are an important factor here, for the Mycenaeans may have received such Asian material in filtered form and not directly. One must also allow for the Minoans’ own contributions, and Mycenaean innovation. Clearly, then, any Mesopotamian musical ideas which may have reached the Mycenaeans would have had a substantially different appearance than those adopted in the Orientalizing period. At the same time, since the cuneiform texts show significant musical continuity over this period, it is possible that Mycenaean musical thought, could it be recovered, might resonate with that of the Archaic period.
- 4.11 Could any of this have survived the collapse of the palaces? After all, writing, which I have invoked as a parallel to the adaptation of Asian heptatony, disappeared without a trace except in Cyprus (cf. 2.7, 2.10). Yet different fates awaited literacy and lyre. Whereas seven-stringed tunings were lost with Linear B, the lyre itself endured. Homer considered the instrument standard equipment for every αἰδώς, which shows that this had been true for generations. Indeed, the lyre must have been the epic singer’s tool from the palatial period, since the instruments of the Archaic and Classical periods descend more clearly from Minoan and Mycenaean archetypes than Near Eastern designs current in the time of Terpander.²¹ We have seen, besides, how the Mycenaean association of lyre with birdsong persisted into the Archaic period (cf. 3.31). Clearly, then, the lyre, if it had ever been restricted to the palaces, had already in the Mycenaean period entered the Greek musical tradition generally.
- 4.12 Consequently, heptatonic music must not in fact have achieved the same popular dispersion in the Mycenaean period as the lyre itself. Thus, even in those areas most directly heir to Mycenaean poetic lore, such as Lesbos and Ionia, it is essentially the

²⁰ Horrocks (1980); (1997), 201ff.; West (1988), 156.

²¹ See West (1992), 49f.

Indo-European art—admittedly somewhat Orientalized itself—which was pursued through the Dark Age and down to Homer, to the exclusion of heptatony. One cannot merely draw a distinction between classical and popular music, since ‘popular’ is misleading in reference to the ancestral song tradition, which in its own right had a very high cultural status. It is a case rather of two independent traditions of art music, one with and one without the general support of the people. An important principle emerges: the lyre must be regarded as separable from and subject to different laws of dispersion than the styles of music for which it may be used, just as Terpander could later adapt the now-traditional Homeric φόρμιγξ to his ‘new’ heptatony.

- 4.13 At the same time, despite the disappearance of palatial heptatony, it is from these same areas that any memory of Mycenaean musical lore is likely to emerge. If this scenario seems implausible, consider the abundance of scenes in Homer which feature seemingly Mycenaean court music. Whether accurate or anachronistic, the recollection of professional trivia—a predilection still seen in the historical material collected by the fourth-century musicologists—provides the necessary condition for at least some continuous memory. For music and musicians would naturally have been a favorite topic of the singers, acquiring in time a legendary character, like the archetypal *guslar* who takes his place among other heroic figures of South Slavic epic.²²
- 4.14 The most probable area of survival concerns the language and concepts of harmony, which in later Greek sources is ubiquitously allied to music. ἄρμονία as “tuning” is not securely attested until the late sixth century by Lasus of Hermione,²³ although it probably appears a century earlier in a fragment of Sappho.²⁴ Yet the involvement of

²² See Foley (1999), 55.

²³ Lasus fr. 1 (PMG 702): Δάματρα μέλπω Κόραν τε Κλυμένοι' ἄλοχον / μελιβόαν ὕμνον ἀναγνέων / 'Αιολίδ' ἄμ βαρύβρομον ἄρμονίαν (“Demeter I sing and the maiden bride of Clymenos, / raising a honey-voiced hymn / in the deep-rumbling Aeolian *harmonia*”); the next attestations are Pi. N. 4.45: Λυδίᾳ σὺν ἄρμονίᾳ, cf. fr. 140b2; Pratin. fr. 5b.3 (PMG 712): Αἰολίς ἄρμονία; Ion of Chios fr. 32 (West).

²⁴ Sapph. fr. 70.9-11 (Voigt):]αρμονίας ιδ] /]αθην χόρον, ἅα /] ιδε λίγηα, where χόρον and especially λίγηα provide the context, as against the wedding of Harmonia; cf. Hom. *Il.* 18.569: φόρμιγγι λιγείῃ, etc.; Sapph. fr. 103.6-9 (Voigt): ὀ]ιππιοτ' αἰοιδαι φριέ]ν[. . .]αν. [/]ισ]αιοισα λιγύραν [αἰ]δαν / γά]μβρον, ἅσαροι ιγ]αίρι ι]ύ]μαλι]ικ[/]σε φό]βαισιν θεμέ]ν]ια λύρα; Stesich. 278 PMGF: ἄγε Μοῦσα λιγεί' . . . / . . . φθεγγομένα λύραι.

harmonic language—that is, derivatives of Proto-Indo-European *ar-, “to fit or join”—in the concepts of music was considerably more ancient. Harmony is recognized as apposite to the intellectual and verbal process by both Homer and Hesiod,²⁵ and the name Homer itself is a probable derivative, understandable in light of the ‘builder of words’, a celebrated Indo-European conceit.²⁶ The harmony of poetics was elaborated throughout the Classical and Hellenistic periods, particularly by the school of ‘euphonists’.²⁷ But the application of harmonic language to the tonal aspect of music specifically derives from the actual construction of the lyre which, like the bow, is an example of physical harmony.²⁸ Thus the two devices are paired by Heraclitus:

οὐ ξυνιᾶσιν ὅκως διαφερόμενον ἐωυτῷ συμφέρεται· παλίντροπος²⁹ ἁρμονίη
ὅκωσπερ τόξου καὶ λύρης.³⁰

They do not understand how that which diverges converges on itself: for *harmonia* is turning-back-around, like that of bow and lyre.

4.15 But the paradigmatic association of bow and lyre was already traditional by the late sixth century, being firmly entrenched in Greek epic. Odysseus, stringing his bow, is

²⁵ There is the epic word ἄρτιεπής, “fitting of word” (cf. Sanskrit *ṛtávat*, “speaking truth”), as well as Hom. *Od.* 4.777: μῦθον, ὃ δὴ καὶ πᾶσιν ἐνὶ φρεσὶν ἤραρεν ἡμῖν (“A plan which was suitable to all our minds”). Cf. Epich. fr. 250 CGF: νᾶφε καὶ μέμνασ’ ἀπιστεῖν· ἄρθρα ταῦτα τᾶν φρενῶν.

²⁶ Nagy (1979), 297-300.

²⁷ Janko (2000), 165-89, etc. Cf. schol. a *ad Ar. Eq.* 533: καὶ γὰρ ἁρμονίαν λέγομεν τὴν τῶν ποιημάτων σύνθεσιν.

²⁸ See Kirk (1954), 207ff.

²⁹ The variant παλίντονος has been adopted by most editors. παλίντροπος is, however, the *difficilior lectio*: since παλίντονος is a common Homeric epithet for the bow, and since Heraclitus’ examples are both stringed instruments, the substitution of -τονος for -τροπος is predictable. Yet the harmonic principle is exhibited in many other devices, a situation better suited to the more general -τροπος. For the textual issue see Kirk (1954), 207f. and Kirk/Raven/Schofield (1983), 192 n.1 with further literature, supporting παλίντονος. Diogenes Laertius 9.7, who summarizes the Heraclitean position as διὰ τῆς ἐναντιοτροπῆς ἡρμόσθαι τὰ ὄντα (“the things which are have been harmonized through ‘opposite turning’”), has not been given sufficient weight. See also 6.32.

³⁰ Heraclit. fr. 22B51 D-K.

compared to a citharist putting on a new string.³¹ There is also the epic formulaic language which describes the domain of Apollo as “the κίθαρις and angled bow”.³² In all likelihood the conceptual link between the hunting and the musical bow dates to the invention of the one from the other—which came first is still debated by organologists, but the bow at least was already extremely ancient at the time of Indo-European unity.³³ In fact, bow and lyre are anatomically akin in Greek vocabulary, sharing πήχεις or κέρατα, ζυγόν and string.³⁴ As simple as it is ingenious, the bow is a sort of mechanical riddle, a σῆμα worthy of Apollo as god of divination³⁵—and as

31 Hom. *Od.* 21.406-11.

32 *H. Ap.* 131: εἴη μοι κίθαρις τε φίλη καὶ καμπύλα τόξα; and *h. Merc.* 515 κίθαριν καὶ καμπύλα τόξα; cf. *Call. Ap.* 18f.: εὐφημεῖ καὶ πόντος, ὅτε κλείουσιν ἄοιδοί / ἢ κίθαριν ἢ τόξα. Λυκωρέος ἔντεα Φοίβου (“The sea too is silent, when singers celebrate either the *cithara* or bow, the weapons of Lycoreian Phoebus”), 43f.; *Hor. Od.* 2.10.18ff.: *quondam cithara tacentem / suscitāt Musam, neque semper arcum / tendit Apollo.*

33 One Greek tradition holds that Apollo invented the lyre after hearing the tuneful twang of his (or his sister’s) bowstring (ps.-Censor. *de Mus.* 6.610.8ff.). Generally speaking, the bow seems to have been regarded as the more fundamental example of harmony; cf. Philodem. *Poem.* 1.93.19-24 (Janko): καθάπερ γὰρ ἐν ὀρ[γ]άνῳ, [ἐτι] μᾶλλον δὲ κἂν τῷ βίῳ, οὐδεμί’ ἐκ[τ]ί[α]ι ἀρμογὴ τ[οῦ] ὅλοις ἢ μὴ [δο]κει[ν] συγκόλλη]σις καὶ ἔ[ν]ωσις ἀκ[ο]λουθεῖν (“just as in an instrument, and still more so in the bow as well, there will be no harmony for wholes whereby cohesion and unity does not seem to follow”).

34 In the bow, the πῆχυς is the center piece which holds together the κέρατα (*Hom. Il.* 11.375, 13.583, *Od.* 21.419). In the lyre it is usually the ζυγόν which joins the κέρατα, but it is also called a πῆχυς (*Ath.* 14.637d = Artemo Cass. *FHG* 4 p.342 fr. 12). Conversely, there is no problem in seeing the centerpiece of the composite bow as a ζυγόν in function if not in name.

35 The bow is in fact a frequent shamanic totem: Eliade (1958), 104; cf. (1951), 174f. It is emblematic of the pursuit of knowledge in *Rgveda* 1.84.16, 9.96.1, 10.42.1, 10.87.4, and there is an extended metaphor in the *Mundaka-upaniṣad* (2.3.4) reminiscent of the chariot parables.

the harmonic god *par excellence*, whose allotment included κίθαρις καὶ καμπύλα τόξα.³⁶

- 4.16 Although the Heraclitean pairing with bow naturally leads one to expect that the ἄρμονία of the lyre has to do with string tension—as does the variant παλιντονος—clearly ἐπὶ δὲ ζυγὸν ἤραρεν ἀμφοῖν in the *Hymn to Hermes* (cf. 2.23) refers to something more.³⁷ Harmonizing the instrument's arms with a yoke establishes a closed, circular relationship among the instrument's various parts; the same is true of the bow's πῆχυς, and both acts are described in epic language by the harmonic verb ἀραρίσκω.³⁸ This taut frame transmits the vibration of the strings is transmitted to the resonator, reinforcing their voices like the sounding board of a piano.³⁹ The lower ends of the lyre's arms are held in place by means of cowskin tightly stretched over the tortoiseshell resonator—a process which Sophocles

³⁶ Pi. P. 8.67f.: ὦναξ, ἐκόντι δ' εὐχομαι νόῳ / κατὰ τιν' ἄρμονίαν βλέπειν ("O Lord Apollo, I pray with willing mind look in accord with a certain harmony"). As Plato tells us (*Cra.* 404e-405d), "this god is in charge of harmony" (ἐπιστατεῖ δὲ οὗτος ὁ θεὸς τῇ ἄρμονίᾳ), a four-fold domain comprising μουσική, τοξική, μαντική, and ιατρική; Apollo's harmonic nature is emphasized by repeated wordplay: οὐ γὰρ ἔστιν ὅτι ἄν μᾶλλον ὄνομα ἤρμοσεν ("for there is no name which would have 'fit' better"); εὐάρμοστον μὲν οὖν [sc. τὸ ὄνομα] ("in fact the name 'fits' quite well"). For a similar division of his domain, cf. *h. Ap.* 131f. (cited in 5.6); *Call. Ap.* 42-6; *D. S.* 5.74.5.

³⁷ *H. Merc.* 50.

³⁸ Hom. *Il.* 4.110 of Pandarus' bow: καὶ τὰ μὲν [sc. κέρα] ἀσκήσας κεραξόος ἤραρε τέκτων ("And working the horns the bowyer joined them"); cf. *Anth. Pal.* 6.113.3 (Simmias): κεραξόος ἤρμοσε τέκτων, of a lyre's body; *H. Merc.* 50: καὶ πῆχεις ἐνέθηκ', ἐπὶ δὲ ζυγὸν ἤραρεν ἀμφοῖν ("and he put in the arms, and fitted a yoke on both"). It is tempting to find the harmonic lyre attested in Archil. fr. 54.17 (West), connecting] .μοσω. [(line 17) with λύρην in line 11; but the traces to the left yield, according to West's apparatus, κ, χ, or ν, and the separation is perhaps too great.

³⁹ This aspect of the instrument's construction is attested by ps.-Arist. *Pr.* 19.42: εἰ πληγείσης τῆς νεάτης . . . συμβαίνει τὸν ζυγὸν κινεῖσθαι, οὐθὲν ἄν εἴη θαυμαστόν. κινηθέντος δὲ πάσας τὰς χορδὰς συγκινεῖσθαι καὶ τιν' ἦχον ποιεῖν οὐκ ἄλογον ("If, when [sc. the string] νήτη is struck, the yoke happens to move also, it would not be strange. And when it moves, it is not unreasonable that all the strings move with it and make some sound/resonance [ἦχον]"). See also Gombosi (1944), 170.

described with the verb καθαρμοζω.⁴⁰ Thus the various relationships between the lyre's parts are seen as ἀρμονίαι, while the finished instrument, taken as a whole, is also a ἀρμονία.⁴¹ Thus, according to Plutarch, there were those who tried to explain the relationships between tortoise-shell, yoke, and tuning pegs in terms of the consonant ratios, "whereas *that* harmony must be sought in the lyre's musical tones".⁴²

- 4.17 But of course the strings, once strung between the yoke and tailpiece, also take part in the instrument's harmony, exerting their influence on the other parts of the whole system. The proper adjustment of a string, each of which was its own ἀρμονία,⁴³ becomes in a sense a further stage of construction, and the tuning which ultimately results is quite literally equivalent to the overall harmony of the instrument. Provided that all the strings have been set at the desired pitches—whatever these may be—every tuning may be considered a ἀρμονία. Consider the important definitions compiled in the *Suda*:

ἀρμονίαν: τὸ "εὖ καὶ ἐπισταμένως" εἶναι τὴν νευρὰν ἐν τοῖς κρούμασι τῶν ἁσμάτων.⁴⁴ ὅτι ἡ ἀρμονία ἐπιγίνεται τοῖς ἡρμοσμένοις· δεῖ γὰρ εἶναι τὰς χορδὰς, εἴτα τοιῶσδε ἐπιταθῆναι, καὶ οὕτως ἐπιγενέσθαι τὴν ἀρμονίαν. οὐ

⁴⁰ S. *Ichn.* 346 (Maltese): καθήρ[μ]ο[σε]. The text here is badly damaged, but the context makes it clear that cow-skin is involved.

⁴¹ Cf. S. fr. 244.1 *TrGF*: ῥηγνύς ἀρμονίαν χορδοτόνου λύρας ("breaking the harmony of the lyre"); *Anth. Pal.* 2.126f. (Christodorus): λύρης . . . ἀρμονίην; also 6.113.3 κεραοξόος ἡρμοσε τέκτων, noting that the description is equally suited to a bow. There is often an ambiguity between the physical harmony of the instrument and the tuning of its strings, which illustrates how the tuning is the sum total of the instrument's harmony.

⁴² Plut. *De anim. procr.* 1030b: ὁ τοὺς ἐπιτρίτους καὶ ἡμιολίους καὶ διπλασίους λόγους ζητῶν ἐν τῷ ζυγῷ τῆς λύρας καὶ τῇ χελώνῃ καὶ τοῖς κολλάβοις γελοῖός ἐστι (δεῖ . . . τὴν δὲ ἀρμονίαν ἐκείνην ἐπὶ τῶν φθόγγων θεωρεῖν).

⁴³ The physical rather than musical harmony of strings is implicit or explicit in the bow-lyre material; cf. D. S. 3.59.5: τῆς κιθάρας ἐκρῆξαι τὰς χορδὰς καὶ τὴν εὐρημένην ἀρμονίαν ἀφανίσαι ("[sc. Apollo] broke the strings of the *cithara* and banished the ἀρμονία he had discovered"); *Anth. Pal.* 9.584.8 (Anon.); *Suda* s.v. ἀρμονίαν, cited below.

⁴⁴ This much is found in schol. *ad Ar. Eq.* 994: ἀρμονίαν· οἱ μουσικοὶ καλοῦσι τὸ εὖ καὶ ἐπισταμένως εἶναι τὰς νευρὰς ἐν τοῖς κρούμασι τῶν ἁσμάτων, noting the plural τὰς νευρὰς versus τὴν νευρὰν in the *Suda*.

μάχεται δε τοῖς ἡρμωσμένοις, ἀλλ' ἔπεται οὕτως ἔχουσα, ὥς ἂν ἔχη τὰ ἡρμωσμένα.⁴⁵ ἔστι δὲ ἀρμονία συμφωνία τῶν χορδῶν.

ἀρμονία: when the string is well- and knowledgeably-tuned in the instrumental accompaniment of songs. [sc. And note] that *harmonia* supervenes (ἐπιγίνεται) on things that have been harmonized (τοῖς ἡρμωσμένοις); for there must be strings, and then these must be tuned in such-and-such a way, and thus the *harmonia* supervenes. And the *harmonia* is not in conflict with its harmonized components (τοῖς ἡρμωσμένοις), but follows upon them; and whatever the nature of the harmonized components, such is the nature of the *harmonia*. And *harmonia* is also the consonance (συμφωνία) of strings.

The synonymy of ἀρμονία and συμφωνία is usually dominant in Classical sources, as epitomized by Plato's formulation ἡ γὰρ ἀρμονία συμφωνία ἐστίν.⁴⁶ Here, however, it appears as a secondary layer, as though reflecting a bifurcation in the history of lyre tuning, with the resonant diatonic method usurping an older vocabulary. The astonishing dactylic definition of ἀρμονία as τὸ "εὖ καὶ ἐπισταμένως" εἶναι τὴν νευράν, and its suggestion of an oral technical vocabulary, is considered in the next chapter (5.16-19).

- 4.18 The complex totality of harmonic language as applied to the lyre and its tunings is well be illustrated by *Knights* 531-533, where Aristophanes portrays Cratinus, once the darling of the Old Comedy stage, as drunken and discarded like a worn-out *cithara*:

⁴⁵ This extract comes from Phlp. *in de An.* 142.6-16 (Hayduck).

⁴⁶ Pl. *Smp.* 187b; cf. Ion of Chios fr. 32.2 (West): τὰς συμφωνούσας ἀρμονίας τριόδους; Hp. *Vict.* 1.8: ἀρμονίης ὀρθῆς, ἐχούσης συμφωνίας τρεῖς . . . ἦν δὲ μὴ τύχη τῆς ἀρμονίης μηδὲ σύμφωνα τὰ βαρέα τοῖσιν ὀξέσι γένηται κ.τ.λ.; 1.18, cited in 2.25; Pl. *Cra.* 405c: τὴν ἐν τῇ ᾠδῇ ἀρμονίαν, ἣ δὲ συμφωνία καλεῖται; *Resp.* 4.430e: συμφωνία τινὶ καὶ ἀρμονία; 10.616b: ἀρμονίαν συμφωνεῖν; *Phlb.* 56a; 'Plato' ap. ps.-Plut. *de Mus.* 1138d: ἀρμονίαν . . . τὴν αἰτίαν τῆς πρὸς ἄλληλα ἐξ ἀνομοίων συμφωνία; Arist. *Cael.* 2.9.290b12ff.; Plut. *Inst. lac.* 238b, cited in 2.39; *De E Delph.* 389d: τὸ γὰρ πλεῖστον . . . ἔργον ἀρμονικῆς περὶ τὰς συμφωνίας ἐστίν; cf. *De anim. procr.* 1030b; Theo Sm. 47.1-3; Adrastus ap. Theo Sm. 49.7; Iamb. *in Nic.* 118.21f. (Pistelli): τῶν καθ' ἀρμονίαν συμφωνιῶν; 119.18f.: τὰ κατὰ μουσικὴν ἐν ἀρμονίᾳ σύμφωνα γίνεται; Aristid. *Quint.* 3.23 (125.15ff.): λέγω δὲ ἀρμονικὸν μὲν λόγον τὸν . . . δηλοῦντα κατὰ συμφωνίαν; ps.-Censor. *de Mus.* 6.609.7 *harmonia est consonantia*.

νυνὶ δ' ὑμεῖς αὐτὸν ὀρῶντες παραληροῦντ' οὐκ ἔλεεῖτε
 ἐκπιπτουσῶν τῶν ἡλέκτρων καὶ τοῦ τόνου οὐκέτ' ἐνόντος
 τῶν θ' ἀρμονιῶν διαχασκουσῶν.⁴⁷

But now you feel no pity when you see him mumbling to himself,
 His pegs popping out and all out of tune,
 And his joints (*harmoniai*) all gaping at the seams.

The primary reference of ἀρμονία here is clearly to the body, rather than strings, of the instrument. The word is attested in many physical contexts (see below), and we learn from a scholiast and elsewhere that both ἀρμονία and τόνος could be used of the connections in a bed-frame (cf. 6.6).⁴⁸ The *cithara* differed from the tortoiseshell lyre in having a resonator made entirely from wood, and doubtless involved a certain amount of mortise-and-tenon joinery. This, in addition to the further harmony of arms and crossbar, explains the use of the plural ἀρμονιῶν. But the contribution of the properly tuned string to the overall ἀρμονία of the instrument is acknowledged by τοῦ τόνου οὐκ ἐνόντος. Coming as it does after this phrase, ἀρμονιῶν διαχασκουσῶν suggests that the final musical tunings (ἀρμονίαι) are less precise than they should be, or once were.⁴⁹

- 4.19 The survival of the Mycenaean lyre finds a number of specifically harmonic parallels. As shown in Appendix A, the words ἀρμονία and ἀρμόζω, so common in later Greek, derive from the Mycenaean word *a-mo* (ἄρμο), “joined thing/wheel”; the vocalization of the sonant nasal *ṛ* as -o- (<**arhmṛ*) is one of the phonetic peculiarities that mark Mycenaean as a dialect apart—specifically that of the ruling elite. Since these forms appear throughout the later dialects, and so must be explained as a universal inheritance from the period of Mycenaean cultural *koine*, surviving in connection with palatial high-technologies which, like the lyre, endured beyond the palaces themselves. Chariot-building was one of these; but as productive as **ap-* was in the language of

⁴⁷ Ar. Eq. 531ff.

⁴⁸ Schol. ad Ar. Eq. 532b: καὶ τοῦ τόνου οὐκέτ' ἐνόντος· ἀκολουθῶς μετὰ τὴν κλίνην ἐμνημόνευσε τοῦ τόνου. τόνος γὰρ τὰ τῶν κραββάτων σχοινία; schol. ad 533a: ἀρμονίας λέγομεν τὰ συμπησσόμενα τῶν κραββάτων μέρη, replicated in the *Suda* s.v. ἀρμονίαν.

⁴⁹ A similar multivalence of physical and musical meaning may be present in S fr. 244.1 and D. S. 3.59.5, cited above.

the tablets, most of the Mycenaean chariotry terms are not found in Homer;⁵⁰ conversely, ἀρμονία and ἀρμόζω are found in many construction contexts which had their Bronze Age equivalents, but are not so attested in Linear B. So ἀρμονίαι, used by Homer of the connections between ship-timbers,⁵¹ describe the mortise-and-tenon joints used in Greek hulls continuously from the Bronze age.⁵² The mythological joiner Harmonides, while generally handy, is best remembered as having built Paris' vessel;⁵³ Plutarch postulates that he was so named because "no work needs harmony as much as does a ship".⁵⁴ The complementary join of these ἀρμονίαι nicely exemplifies the reciprocity which the pre-Socratics always associate with the word—attested already in the Homeric use for a mutually-binding agreement between two warriors.⁵⁵

- 4.20 Forms of ἀραρίσκω (< *αρ-) and ἀρμόζω are common in Homer to describe intricate joinery of various types, prime examples of the δαίδαλα discussed by Morris (1992) as emblematic of Bronze Age technical achievements, and known to the legendary joiner Harmonides.⁵⁶ These words are conspicuous in formulas for sophisticated armor and weaponry,⁵⁷ embedded in arming-scenes whose thematic stability indicates

⁵⁰ Heubeck (1961), 169f.

⁵¹ Hom. *Od.* 5.247f., 361f.; cf. Pl. *Resp.* 10.616c: τὰ ὑποζώματα τῶν τριήρων, of the understructure of triremes, used as a simile in the context of cosmic harmony.

⁵² Morrison/Coates (1986), 184f.

⁵³ Hom. *Il.* 5.60ff.

⁵⁴ Plut. fr. 110: οὐδὲν γὰρ οὕτως ἀρμονίας δεῖται τῶν ἔργων, ὥς ναῦς.

⁵⁵ Hom. *Il.* 22.254f.: ἀλλ' ἄγε δεῦρο θεοὺς ἐπιδώμεθα· τοὶ γὰρ ἄριστοι / μάρτυροι ἔσσονται καὶ ἐπίσκοποι ἀρμονιάων: ("But come, let us give our gods on it; for they will be / the best witnesses and overseers of *harmoniai*"); cf. *Il.* 23.712f. where harmonic language is used of rafters: ὥς ὅτ' ἀμείβοντες, τοὺς τε κλυτὸς ἦραρε τέκτων / δώματος ὑψηλοῖο, βίας ἀνέμων ἀλείνων ("Like rafters [literally "interchangers"], which a renowned builder joins for a lofty house, a defense against the violence of winds"); the formula ἦραρε θυμὸν ἐδωδῇ (*Od.* 5.95 and 14.111) describes "matching" one's appetite with the right amount of eating. See also *Il.* 16.214f.

⁵⁶ Hom. *Il.* 5.60f.: Ἀρμονίδεω, ὅς χερσὶν ἐπίστατο δαίδαλα πάντα / τεύχειν.

⁵⁷ Of greaves fitted with ankle-pieces, Hom. *Il.* 3.331, 11.18, 16.132, 18.459, 19.370; of helmets closely fitted to the skull, *Il.* 13.188, 18.611, *Od.* 22.102; of a "joined" corselet, *Il.* 3.333; of a shield "fitted" with two rods, *Il.* 13.407; of a spear or whip which fits the hand perfectly, *Il.* 19.396, *Od.* 17.4; of a well-joined ax *Od.* 5.236.

an origin deep within the tradition.⁵⁸ We also find harmonic language in descriptions of fortifications—city walls ‘articulated’ by gates or towers,⁵⁹ or the construction of gates themselves⁶⁰—and stonework continued to be so understood throughout the Classical period and beyond.⁶¹ A prominent example of this τόπος is the harmonic construction of Thebes, the historical seven gates of which were preserved in epic memory⁶²—after all they were still there to be seen⁶³—and which served as the model

⁵⁸ These arming scenes include *Il.* 3.330-9, 11.20-45, 16.135-9. For Serbo-Croatian parallels see Lord (1980), 89-93.

⁵⁹ Hom. *Il.* 15.737: πόλις πύργοις ἀραρυῖα (“A city ‘fitted’ with towers”); *Od.* 7.44f. of the Phaeacian city: τείχεα μακρὰ / ὑψηλά, σκολόπεσσιν ἀρηρότα, θαῦμα ιδέσθαι (“Walls, great and high, ‘joined’ with look-out posts, a wonder to see”). Hes. *Sc.* 271f.: χρύσειαι δέ μιν εἶχον ὑπερθυρίοις ἀραρυῖαι / ἑπτὰ πύλαι (“And seven gates of gold held it, ‘harmonized’ at the lintels”); cf. Parm. fr. 28B1.11-20 D-K: ἐνθα πύλαι Νυκτός τε καὶ Ἡματός εἰσι κελεύθων . . . ταὶ δὲ θυρέτρων / χάσμ’ ἀχανὲς ποίησαν ἀναπτάμεναι πολυχάλκους / ἄξονας ἐν σύριγξιν ἀμοιβαδὸν εἰλίξασαι / γόμοις καὶ περόνησιν ἀρηρότε (“There the gates are of the paths of Night and Day . . . The doors, / Harmonized with dowels and with hasps, / Flying open made a gaping gap, and swung in turn the / Greatly-brazen axles in their slots”); also Hom. *Il.* 23.712f. of rafters, cited above.

⁶⁰ Hom. *Il.* 7.339, 7.438, 9.475, 12.454-6, 18.275, 21.535, 24.318: ἐν κληῖς’ ἀραρυῖα; *Od.* 2.344, 21.236, 21.382, 22.128, 22.155, 22.258, 22.275, 23.42. At *Il.* 12.134 Polypoetes and Leonteus are compared to oaks fitted with great roots (ρίζησιν μεγάλησι . . . ἀραρυῖαι) as they defend the city; the image is clarified by Hes. *Th.* 811f. which describes “gates equipped with roots” (πύλαι καὶ χάλκεος οὐδὸς / . . . ρίζησι . . . ἀρηρώς).

⁶¹ Hdt. 1.163: τοῦτο δὲ [*sc.* τὸ τεῖχος] πᾶν λίθων μεγάλων καὶ εὖ συναρμοσμένων; E. *IA* 1212: ὁμαρτεῖν μοι πέτρας; D. S. 2.8.2; Paus. 8.8.8, 9.33.7; *Suda* s.v. ἄρμονίαν.

⁶² Hom. *Il.* 4.406, *Od.* 11.263f.; Hes. *Op.* 162; [Hes.] *Sc.* 49; Nonn. *D.* 8.52, 25.11, 31.159, etc.; also ἑπτὰ πύλ- Hes. *Sc.* 272, Nonn. *D.* 5.68. The epithet imparts an epic flavor in many lyric and tragic passages: Pi. *P.* 3.90, 8.39, 9.80, 11.11, *N.* 4.19, 9.18; *I.* 1.66, 8.15a; fr. 94b60, 169a47 (S-M); B. 19.47; A. *Th.* 165; S. *Ant.* 101, 119; E. *HF* 543, 782, *Ph.* 79; cf. Opp. *Cyn.* 3.452.

⁶³ Paus. 9.8.4: Θηβαίοις δὲ ἐν τῷ περιβόλῳ τοῦ ἀρχαίου τείχους ἑπτὰ ἀριθμὸν ἦσαν πύλαι, μένουσι δὲ καὶ ἐς ἡμᾶς ἔτι (“In the periphery of the ancient wall at Thebes there were seven gates in number, and they remain still even in our times”).

for the peaceful city in the *Shield of Heracles*.⁶⁴ Following the episode of war, the city's patroness Harmonia is inevitably suggested.⁶⁵ This clearly illustrates the path taken by the epic τέχνη from the Mycenaean mainland, through the Aeolic migration eastwards, and ultimately reaching the Ionian singers.

4.21 Hesiod is said to have treated the myth of Amphion's founding of Thebes through the power of his *cithara*.⁶⁶ A prominent detail in later treatments of this myth is the correlation of the seven gates with the instrument's seven strings. It is not stated that Hesiod specified a seven-stringed lyre, and though this seems a probable and attractive assumption, it is in fact a difficult crux if one accepts the arguments for a new heptatonic music in the Orientalizing period, and if the episode is correctly attributed to Hesiod. Was the one-to-one association of gate and string as traditional as the epic theme of seven-gated Thebes. If, however, Hesiod has added the detail of the lyre to the foundation myth, why should he do so if the seven gates could not be correlated with seven strings? The alternative, that the lyre-building detail was traditional, but there was no correlation between number of gates and strings, is the most difficult to accept. Consequently, the poet either revitalized the myth with knowledge of the new heptatonic music—thus attesting a pre-Terpandrian awareness of the seven-stringed lyre—or inherited directly the memory of Mycenaean heptatony; it is, after all, from Thebes that the word lyre-player is now attested (cf. 5.7). But perhaps it is simplest to suppose that the episode—whose authenticity was questioned in antiquity⁶⁷—was falsely ascribed to Hesiod, occurring in the later *Catalogue of Women*, and that the correlation of seven gates with seven strings was made by an anonymous melic poet after the heptatonic lyre had become firmly established in the seventh century.

4.22 And yet the persistence of Bronze Age harmonic ideas in poetic contexts is suggested by the verb ἀραρίσκω, principally poetic in later Greek as against the more prosaic

⁶⁴ [Hes.] *Sc.* 271f.: χρύσειαι δέ μιν εἶχον ὑπερθυρίοις ἀραρυῖαι / ἑπτὰ πύλαι ("And seven gates of gold held it, 'harmonized' at the lintels").

⁶⁵ For seven-gated Thebes as the city of Harmonia, *Pi. P.* 3.90f.: καὶ ἐν ἑπταπύλοισι / . . . Θήβαις, ὁπόθ' Ἀρμονίαν γάμεν βοῶπιν ("and in seven-gated Thebes . . . when [sc. Cadmus] married cow-eyed Harmonia").

⁶⁶ Hes. fr. 182 (M-W): περὶ Ζήθου καὶ Ἀμφίονος ἱστοροῦσιν ἄλλοι τε καὶ Ἡσίοδος, ὅτι κιθάρα τὸ τεῖχος τῆς Θήβης ἐτείχισαν.

⁶⁷ Hes. fr. 183 (M-W) = *Ael. VH* 12.36 εἰκόσασιν οἱ ἀρχαῖοι ὑπὲρ τοῦ ἀριθμοῦ τῶν τῆς Νιόβης παίδων μὴ συνάδειν ἀλλήλοις . . . Ἡσίοδος δὲ ἐννέα καὶ δέκα, εἰ μὴ ἄρα οὐκ εἰσὶν Ἡσιόδου τὰ ἔπη.

ἀρμόζω (though this too is found in poetry). Also in a poetic vein is the curious form βητάρμονες (“step-joiners”).⁶⁸ The lack of aspiration—i.e., not the expected *βηθάρμονες (see Appendix A)—indicates that the compound was either formed within the Mycenaean period,⁶⁹ or was very late with Ionic psilosis; but the vocalization -o- supports a Mycenaean origin. This word describes the Phaeacian dancers who circle around Demodocus as he sings the lay of Ares and Aphrodite—the Hesiodic parents of Harmonia⁷⁰—and is probably to be explained by the hand-on-wrist circle dance that is the most commonly depicted type in Geometric vase painting, and which continues through the Archaic period.⁷¹ In Homer’s description—“they danced, holding their hands on each other’s wrists (ὠρχεῦντ’, ἀλλήλων ἐπὶ καρπῷ χεῖρας ἔχοντες)⁷²—we see the reciprocity proper to harmony, and there are parallels for ‘harmonic’ foot-work in military and other contexts from Homer onwards.⁷³ That the verse recurs nearly verbatim in the Homeric *Hymn to Apollo* to describe Aphrodite’s circle—including Harmonia—as they dance around the harmonic god Apollo while he plays the lyre,⁷⁴ suggests the existence of a traditional harmonic τόπος of which this and the Song of Demodocus are merely two extant exemplars. If this is right, then Homer used βητάρμονες knowing its harmonic significance; and if the word is in fact

⁶⁸ Hom. *Od.* 8.250.

⁶⁹ See Heubeck/West/Hainsworth (1988), *ad loc.*

⁷⁰ Hes. *Th.* 933-937. Burkert (1960) provides a good overview of prior scholarship on the Song of Demodocus.

⁷¹ See Prudhommeau (1965), plates 53, 536, 830, 831, 833, 836, 838; Wegner (1968), plates 1b, 2b, 6d; Webster (1970), 5f. with plates 1 and 4.

⁷² Hom. *Il.* 18.594.

⁷³ Hom. *Il.* 16.211-217: στίχες ἄρθεν . . . / ὥς δ’ ὅτε τοῖχον ἀνὴρ ἀράρη πυκινόισι λίθοισι / δώματος ὑψηλοῖο, βίας ἀνέμων ἀλεείνων / ὥς ἄραρον κόρυθές τε καὶ ἀσπίδες ὀμφαλόεσσαι. / ἀσπίς ἄρ’ ἀσπίδ’ ἔρειδε, κόρυς κόρυν, ἀνέρα δ’ ἀνὴρ· / ψαῦον δ’ ἱππόκομοι κόρυθες λαμπροῖσι φάλοισι / νευόντων, ὥς πυκνοὶ ἐφέστασαν ἀλλήλοισι (“Their ranks were joined . . . / And as when a man joins the wall of a high building with / Close-set stones, shutting out the violence of the winds / Thus they joined helmets and bossed shields, / Setting shield on shield, helmet on helmet, and man on man. / And the horsehair helmets touched with the shining crests as the / Men inclined forwards: so closely did they stand upon each other”); cf. 12.105: οἱ δ’ ἐπεὶ ἀλλήλους ἄραρον τυκτῆσι βόεσσι; S. *OC* 197f. (Lloyd-Jones): ἐν ἡσυχαι- / α βάσει βάσιν ἄρμοσαι; *Anth. Pal.* 7.431.3f. ([Simonides]): ποδὸς ἵχνια πρᾶτον / ἀρμόσαμεν.

⁷⁴ *H. Ap.* 182ff., verse at 196.

of Mycenaean antiquity, the language and ideas of harmony enjoyed an unbroken line of poetic development down into the Archaic period.

- 4.23 The survival of ἀραρίσκω in poetic usage and its severance from the more prosaic ἀρμόζω may serve as a linguistic paradigm for this preservation of Mycenaean harmonic technology, for the presumed use of harmonic language in technical musical contexts, and for metaphorical ideas of harmony retained in the memory of the αἰδός. Indeed, it is likely that this mode of thought derives from a specifically Indo-European conception of cosmic Order.⁷⁵ In broad terms, we might see the Aeolic and Ionic epic singers, with the mission of preserving the stories and lore of the palatial period, as part of a diaspora of court culture. Their τέχνη would have included essential and prized musical concepts, despite the lyre's employment now in the restricted, four-voiced αἰδή of inherited epic. Due to the very nature of this technological survival, the language of ἀρμονία would have remained valid for any tuning method, heptatonic or otherwise.
- 4.24 It is most unlikely that we shall learn anything definite of a technical nature about this transition. Yet several general issues may be raised. Do the Mycenaean and Minoan seven-stringed lyres imply diatony merely by virtue of their string-count? Given the immense range of tuning practices found throughout the world, one might suppose that these heptachords were something entirely different. By the same token, 'seven' is a more peculiar qualification than one might realize, due to our own long familiarity with heptatonic scales. The sevenfold division of the octave first attested in Mesopotamia is, as I have argued, the result of a very particular tuning process, deliberately pursued to its logical conclusion (cf. 1.21). It is true that in Greece and India heptatonic scales are found which are not at the same time diatonic. But, as I shall argue for Greece, these partially-microtonal tunings represent the adjustment of a diatonic norm, as shown by Aristoxenus' rule of συνέχεια (7.26-39). If we accept Picken's (1975) Mesopotamian musical continuum (cf. 1.10), we might interpret the

⁷⁵ *Rtá* (Sanskrit) and *Arta* (Old Persian), cognates of ἀρμονία, were central to Indo-Iranian religion: see for instance Lüders (1951-9), 1.13-27, 2.402-654; Gonda (1960), 75-81; Watkins (1995), 85-93; Polomé (1982), 156-172; Brown (1972); for *Arta* in Old Persian aristocratic names, see Kent (1953), 170f.; for Order in the Indo-European world-view, see Benveniste (1973), 379f. I have given two papers on this subject: "Harmonia and Yoga: Cognate Sciences?", delivered at the Eleventh UCLA Indo-European Conference, June 5, 1999; and "Harmony and Indo-European Cosmology", at the Warburg Institute, London, November 3, 1999.

ancient Indian *jatis* in the same light.⁷⁶ The same is true of our own equal temperament. We may assume, then, that the heptatony of the Greek Bronze Age was, like Terpander's seven-stringed *phorminx*, essentially diatonic, though this would not rule out the coexistence of some more Hellenized form of heptatony.

- 4.25 We must contend, then, with the interesting and insoluble complication of the double transmission of a single foreign art. Would the adaptation have occurred the same way twice? Was the Mycenaean importation more superficial, not yielding a proper syncretism, or was there an entirely distinct Hellenization of diatony? Was current harmonic lore musicalized by knowledge of consonance as in the Archaic and Classical periods, or was the lyre merely a further example of harmonic technology? Were there, as with the later Greek lyre, seven distinct string names, and did these somehow reflect imported musical practice? Could any of these have been retained for the Dark Age *φόρμιγξ*, just as some Dark Age names seem to have survived in the later seven-stringed nomenclature (cf. 9.11-19)?
- 4.26 In light of the nine-stringed numeration of the Symphonic Circle standard in the Old Babylonian period (cf. 6.4-5), it is intriguing to find that, according to one eccentric tradition, Orpheus fitted the lyre with nine strings, one for each of the Muses.⁷⁷ The equation of string with Muse might find a parallel in a Neo-Assyrian musical tablet from Sippar.⁷⁸ Though late, this text looks back to the standard nine-stringed Sumerian heptatony. It is a fragmentary list of the first five of the nine canonical strings, with numbers in Sumerian and names in Akkadian, each followed by the

⁷⁶ On the *jatis*, see Widdess (1995), 45ff.

⁷⁷ Ps.-Eratosth. *Cat.* 24: ἐποίησε τὰς χορδὰς ἐννέα ἀπὸ τοῦ τῶν Μουσῶν ἀριθμοῦ ("He made the strings nine, from the number of the Muses"); Callistrat. *Stat.* 7.2: μετεχειρίζετο δὲ τὴν λύραν, ἣ δὲ ἰσαρίθμους ταῖς Μούσαις ἐξῆπτο τοὺς φθόγγους ("And he was grasping the lyre in his hand, and it was fitted in notes equal-numbered to the Muses"); Avien. 2.624ff.: *hic iam fila novem docta in modulamina movit / Musarum ad speciem Musa satus, ille repertor / Carmina Pleiadum numero deduxerat* ("He now, born from a Muse, moved nine strings in learned modulations in reflection of the Muses, while the inventor himself [sc. Apollo] had drawn his songs from the number of the Pleiades [i.e. 7]"); cf. schol. *ad Arat.* 269 (212 Martin); schol. *Germ.* (83.21, 150.17 Breysig). There is also an example of a nine-stringed instrument in the mid-sixth century, Paris E643: cf. Maas/Snyder (1989), 38, 51 fig. 15a; West (1992), 62.; cf. Chionid. fr. 4 K-A; Aristoxenus recorded an ἐννεάχορδον in a list of foreign instruments (fr. 97); cf. Phillis ap. Ath. 636b; Apollodorus *FGrH* 244F219; West (1992), 77.

⁷⁸ BM 65217 + 66616. See Kilmer (1984).

beginning of a benediction addressed to a separate divinity. Could this text not attest some sort of apotheosis of the strings? According to Plutarch, the Greek strings μέση, νήτη and υπάτη were enshrined as Muses at Delphi.⁷⁹ Plato equates the diatonic strings with the Sirens,⁸⁰ expanding on a Pythagorean tradition which found the Sirens in the octave.⁸¹ Still further back, Alcman identified the Muse with a Siren, and the Sirens with the individual voices of a chorus.⁸² To this general context belongs the Pythagorean association of the seven strings with the Pleiades⁸³ and the planets.⁸⁴

- 4.27 It is difficult to dismiss the Orphic nine-stringed lyre as Alexandrian elaboration, since the number seven is so deeply entrenched elsewhere in the mythology of the instrument, and more particularly that of Orpheus himself: it is a type of *difficilior lectio*.⁸⁵ And yet the two ‘readings’ are easily reconciled; for when instrument is separated from tuning, the number of strings is less important than how they were tuned. In Mesopotamia, the same heptatonic tunings served instruments of seven, nine, and even thirty strings (10.2-5; cf. 2.22). Likewise, we find both seven- and eight-stringed lyres in the Minoan and Mycenaean evidence. The same perspective could unite the two forms of Orphic lyre—if the nine-stringed tradition has any real historical value.
- 4.28 The more usual seven-stringed lyre of Orpheus figures in a remarkable mythological patchwork, committed to writing by Nicomachus of Gerasa in the first century A.D., and later excerpted by an unknown hand. Allowing for the shortcomings of myth as an accurate record, this catalogue of lyre-lore is in striking conformity with the historical picture that has been emerging from the study of the Terpandrian tradition:

79 Plut. *Quaest. conv.* 744c: νήτη καὶ μέση καὶ υπάτη· καίτοι Δελφοί γε τὰς Μούσας οὕτως ὠνόμαζον. οὐκ ὀρθῶς; cf. 745b; ps.-Censor. *de Mus.* 6.610.1ff.; SEG 30.382. See further 9.40.

80 Pl. *Resp.* 10.616b-617d.

81 Iamb. *VP* 18.82 (47.16 Deubner): ἡ ἀρμονία, ἐν ἣ αἱ Σειρήνες.

82 Alcman. 30 *PMGF*; 1.96ff.; the connection of Muse and Siren is also found at e.g. Plut. *De anim. procr.* 1029c-d. On musical Sirens, see further West (1992), 224.

83 Arist. *Metaph.* 14.1092b26ff.; Alex. Aphr. *In Metaph.* 1093a13; Avien. 621.

84 Nicom. *Ench.* 3 (241-242); *Exc.* 3 (271.16-273.24); *Exc. Neap.* 2 (412.1-8), 24 (418.14-419.7); Aristid. *Quint.* 3.21-22.

85 For the seven-stringed lyre of Orpheus, cf. Alex. Polyh. *FGH273F77* = ps.-Plut. *de Mus.* 1132f.

τὴν λύραν τὴν ἐκ τῆς χελώνης φασὶ τὸν Ἑρμῆν εὕρηκέναι καὶ κατασκευάσαντα ἐπτάχορδον παραδεδωκέναι τὴν μάθησιν τῷ Ὀρφεϊ. Ὀρφεὺς δὲ ἐδίδασκε Θάμυριν καὶ Λῖνον· Λῖνος Ἡρακλέα, ὑφ' οὗ καὶ ἀνῆρέθη. ἐδίδασκε δὲ καὶ Ἀμφίωνα τὸν Θηβαῖον, ὅς ἐπὶ τῶν ἐπτὰ χόρδων ἐπταπύλους τὰς Θήβας ᾠκοδόμησεν. ἀναιρεθέντος δὲ τοῦ Ὀρφέως ὑπὸ τῶν Θρακικῶν γυναικῶν τὴν λύραν αὐτοῦ βληθῆναι εἰς τὴν θάλασσαν, ἐκβληθῆναι δὲ εἰς Ἀντισσαν πόλιν τῆς Λέσβου. εὐρόντας δὲ ἀλιέας ἐνεγκεῖν τὴν λύραν πρὸς Τέρπανδρον, τὸν δὲ κομίσαι εἰς Αἴγυπτον. [εὐρόντα δὲ αὐτὸν *secl.* Jan] ἐκπονήσαντα <δὲ *suppl.* Janko> ἐπιδειῖξαι τοῖς ἐν Αἰγύπτῳ ἱερεῦσιν, ὥς αὐτὸν πρωθευρετὴν γεγεννημένον. Τέρπανδρος μὲν <οὖν *suppl.* Janko> οὕτω λέγεται τὴν λύραν εὕρηκέναι, Ἀχαιοὺς δὲ ὑπὸ Κάδμον τοῦ Ἀγήνορος παραλαβεῖν. τῆνικαῦτά φασιν.⁸⁶

They say that Hermes invented the lyre—the one which is made from a tortoise— and, equipping it with seven strings, handed on the study [τὴν μάθησιν] to Orpheus. And Orpheus taught Thamyris and Linus, Linus Heracles—by whom he was also killed. And he also taught Amphion the Theban, who “seven-gated Thebes constructed” because of the seven strings.

And when Orpheus was torn apart by the Thracian women, his lyre was cast into the sea. But it was tossed back out again at Antissa, a city on Lesbos. Seamen found it, and brought the lyre to Terpander, who carried it to Egypt. Having mastered the instrument [ἐκπονήσαντα],⁸⁷ he displayed it to the Egyptian priests, as though he himself had been its original inventor. And so Terpander is said to have ‘discovered’ the lyre, though the Achaeans received it in the time of Cadmus [ὑπὸ Κάδμον⁸⁸], the son of Agenor. So much they say.

- 4.29 It is not clear whether Nicomachus has compiled the account himself or merely reproduced it from an older source. The latter seems more likely. Nicomachus, who reproduces other traditional Pythagorean lore (cf. 8.8), lived and wrote centuries after the heptachord period; but the archaic seven-stringed norm had persisted in the literate mind and maintained its symbolic potency in the Pythagorean tradition. Like the lyre-construction scene in the *Hymn to Hermes*, we may see here a τόπος of fundamental

⁸⁶ Nicom. *Exc.* 1 (266.2-17); cf. *Exc. Neap.* 23 (418.10-12). On the attribution of this material to Nicomachus, see Jan (1895), 225ff.; for his dates, 211.

⁸⁷ This is preferable to “after much travail in the journey,” for ἐκπονήσαντα then provides a motivation for the following ὥς clause.

⁸⁸ See Smyth (1920), 388 (1698.3.b).

importance to the ἀοιδοί; consequently, it is easy to believe that the passage could have an ancient pedigree. Though such mythological rationalizing became fashionable in the fifth century, the catalogue is itself an ancient oral form. Of especial interest is the dactylic ἑπταπύλους τὰς Θήβας ᾠκοδόμησεν (— uu|— —|— —|— uu|— —), “seven-gated Thebes constructed”, possibly a heroic ἔπος embedded among other epic themes, perhaps a fragment of the Amphion episode attributed to Hesiod. ἑπταπυλ-, as we have seen (4.20), is common in epic formula, but ᾠκοδόμησεν is unparalleled in Hesiod or Homer, and this accords with the later origin of the *Catalogue*.

- 4.30 The history is traced back to Hermes, rather than Apollo, the chief lyre-god according to epic formula. With its glaring omissions of Apollo and Homer, we must see the account as a history not of the lyre, but of the *seven-stringed* lyre (see further 5.8, 5.13-14). Hermes passes “the subject” of seven-strings—note τὴν μάθησιν rather than τὴν λύραν—to Orpheus, the one figure of myth most closely associated with the instrument.⁸⁹ The legend of the Thracian singer received many accretions in the late Archaic and Classical periods in the service of the Orphic mystery religion. Nevertheless, in the present context, especially given the connection with Terpander, the Orphic seven-stringed lyre makes perfect sense as revealing the epic memory of an older Mycenaean heptatony. Thus, in principle, it is possible that Hesiod himself could have known a traditional connection, or devised one himself, between seven-gated Thebes and the lyre of Amphion. Yet perhaps this memory is better traced to Cyprus, where a large, partially literate Mycenaean community continued to flourish after the collapse of the palaces;⁹⁰ or to the kindred Arcadians, whose ancient musical traditions were so well-preserved (cf. 2.37).
- 4.31 Orpheus is assigned a number of students, those other figures of myth who were likewise associated with the seven-stringed lyre. The creation of teacher-pupil relationships is a common contrivance in ancient historiography, yet the convention is given grace by fact that τέχναι such as music were in fact transmitted in this way. In this rationalization may be reflected at least a memory of Bronze Age heptatony as a living tradition which was learned and taught. The magical constructive powers of Amphion’s lyre, as well as Orpheus’ ability to charm and control nature, surely indicate that some aspect of this ancient heptatony was recognized as relevant to an

⁸⁹ The sequence Hermes-Orpheus recurs in schol. Germ. 83.21, 150.17 (Breysig); Isid. *Etym.* 3.22.8-9.

⁹⁰ On the Mycenaean exodus and ‘renaissance’, see e.g. Woodard (1997), 217-224.

understanding of the physical world;⁹¹ and this probably means that resonance was involved, and that the Mycenaean heptatony was the same diatonic *koine* later re-adopted in the Orientalizing epoch. A curious detail common to the myths of Orpheus, Thamyras, and Linus is their violent deaths. Might this not reflect the loss from Greece of seven-stringed music with the destruction of the palaces, when “the lyre of Orpheus was cast into the sea”, over which it had originally come from the Near East?

- 4.32 Since we know that the lyre continued through the Dark Age, it is striking that the next figure mentioned is not Homer (or Phemius or Demodocus), but Terpander himself. The same sequence is found in Timotheus and fragments of Glaucus of Rhegium,⁹² and we recall the tradition that Terpander used “the words of Homer, but the μέλη of Orpheus” (cf. 2.33). The “seamen” mentioned need not be Lesbian fishermen, but might be the professional seamen *par excellence*, the Phoenicians. Terpander is carefully rejected as the true inventor. Rather, the Achaeans received it “in the time of Cadmus”. This curious temporal detail reflects a general bifurcation in the mythology of the Phoenician hero, who came to symbolize the Asiatic contacts of two periods, Mycenaean and Orientalizing.⁹³ It is unclear which is intended here, for the earlier part of the catalogue seems to address the Mycenaean period already; the detail about Cadmus is introduced in relation to Terpander, and yet mention of the Achaeans clearly points to the time of the Bronze Age heroes. Furthermore, the very mention of Cadmus is suggestive of an origin myth, and yet the instrument has already been given a divine creation. Clearly, these inconsistencies are due to the rationalizing of divergent myths. Yet the ambiguity of Cadmus perfectly reflects the two distinct Orientalizing movements with which the seven-stringed lyre may be associated historically. (The mention of Egypt which follows might then be correlated with the rise of power following the collapse of Assyria in 612 B.C., and the increasing Greco-Egyptian relations of the sixth century, through the colony at Naucratis and mercenary service, for example in the Ethiopian campaign of Psamtik II in 591 B.C.⁹⁴)

⁹¹ See Godwin (1987).

⁹² Tim. *Pers.* fr. 15.221-231 (PMG 791), on which see further 8.61-67; Glaucus of Rhegium *FHG* 2 p. 23 fr. 3 = ps.-Plut. *de Mus.* 1133f; p. 24 fr. 4 = ps.-Plut. *de Mus.* 1134e.

⁹³ See generally Edwards (1979).

⁹⁴ See Hdt. 2.154, 2.161. There exist seven ‘inscriptions’ from Greek-speaking mercenaries on the campaign of 591, some of whom may have been second- or third-generation

- 4.33 The transition from the lyre of Orpheus to the instrument of Homer is in a sense a mirror image of the Terpandrian change from four-voiced song to the ἐπτάτονος φόρμιγξ. Yet the two metamorphoses will have been entirely different in their effects upon the Greek music-stream. The Orientalizing movement saw the permanent adoption of 'music'—that is, μέλη—and the diatonicizing of the inherited Indo-European metrical art. The 'music' of the Dark Age was, by contrast, a continuation of the ancestral song tradition, largely unaffected by the heptatony of the palaces. Therefore, in considering the musical confluence of the Orientalizing period and the role played by the Greek tributary, it might well be that the inherited characteristics of this tradition were completely unaffected by resonant intonation prior to the time of Terpander. Yet, again, the lyre is always separable from the various tuning conventions for which it may be used, and diatony is but one means of using resonance. The harmonic stasis of pitch, the essence of the lyre, makes it possible that resonant relationships were exploited in other ways by the Dark Age singers, and that this conditioned their intonation. We cannot begin to guess at what this would have involved—unless it is the chromaticism that Aristoxenus traced to the beginning of *cithara* music (cf. 7.39)—but it is at least permissible to speak of a Homeric 'tone-system' in the strict sense of the word, as opposed to the variably-intoned pitches of the South Slavic singers (cf. 3.22).
- 4.34 To conclude, the Mycenaean situation can only be discussed in terms of the probable: there is obviously no direct, and very little indirect, evidence to confirm the predictions of a model. Fortunately, however, an understanding of the syncretism represented by the Terpandrian tradition is in no way threatened by an unsolved puzzle in the Mycenaean period, since here the direct evidence of literary tradition and vase painting does fit the broad historical picture established in the earlier chapters. With this segment of the stemma illuminated with some surety, the range of solutions to the Mycenaean riddle are greatly restricted. Those suggested here at least account for the existing evidence, while not conflicting with what has been established about the Terpandrian tradition itself.

Egyptian Greeks, as shown by lack of ethnics and peculiarities of script: see Meiggs/Lewis (1969), 12f., with further literature.

5.0 The Lyre of Hermes: The Invention of Music

- 5.1 As we have seen, the internal evidence of the Terpandean verses attests two contrasting styles of music. The historical picture which emerges from the preceding chapters shows that this was no mere juxtaposition, but a confrontation; and not between contrasting styles merely, but between whole musical traditions. Such a situation could only have arisen as one aspect of a greater cultural encounter. There is a favorable combination of data for the transmission to Greece of a Mesopotamian classical music system. The Phoenicians transmitted Orientalizing διδασκαλῖαι. Mesopotamian diatony was known in the Levant during the middle of the second millennium B.C., would have been reintroduced, if forgotten, in the Neo-Assyrian period, and its cosmopolitan status made it suitable for travel to international destinations. Terpander's new seven-stringed lyre appears in the right place at the right time.
- 5.2 The juxtaposition of musical arts lurks just below the surface of the Homeric *Hymn to Hermes* where, we recall (2.23), the crowning feature of the god's invention is the "seven consonant strings" (ἑπτὰ συμφώνους χορδάς). This poem is, as I argue in this chapter, the central document of the melic revolution. It does not merely preserve the memory of two traditions in conflict, but itself bears witness on a formal level to the syncretic process. For the *Hymn* was composed at a late stage of the living epic tradition, which was being simultaneously fossilized to produce the latter-day rhapsodes, whose art was one of mere repertoire (cf. 2.36). At the same time, the poem celebrates the 'invention' of the seven-stringed lyre, the instrument of the new melic music. Moreover, if performed, it would have been with such an instrument, since the seven-stringed lyre was by now standard equipment. It thus follows the Terpandean precedent of singing the ἔπη of Homer to the μέλη of Orpheus (2.33).
- 5.3 The cultural conflict is mythologically encrypted, in the fashion of the time. Apollo is portrayed as a jealous older sibling who feels threatened by a new baby in the family. And with reason. For Hermes, with his theft of Apollo's cattle, his precocious musicianship, and desire for prophetic knowledge, is reaching aggressively for his brother's toys. The poet has cleverly exploited Hermes' traditional role as divine thief—a charge leveled by the resentful Apollo as he grudgingly admires the new sound.¹ In the end, the brothers are reconciled through an exchange of gifts: Hermes

¹ *H. Merc.* 443-6, cited below.

atones for the theft of the cattle by delivering up the lyre, while Apollo grants Hermes limited mantic powers in exchange for the instrument's prophetic qualities.

- 5.4 Sibling rivalry among divinities is a theogonic struggle, for the birth of a new deity requires a new allotment of power: Apollo must now make room for the interloper. This theme is brought to the fore when Hermes, to demonstrate his invention, sings a theogony :

ἐρατὴ δέ οἱ ἔσπετο φωνή,
κράινων ἀθανάτους τε θεοὺς καὶ γαῖαν ἐρεμνὴν
ὥς τὰ πρῶτα γέγοντο καὶ ὥς λάχε μοῖραν ἕκαστος.
Μνημοσύνην μὲν πρῶτα θεῶν ἐγέραιρεν ἀοιδῇ
μητέρα Μουσάων, ἣ γὰρ λάχε Μαιάδος υἱόν· 430
τοὺς δὲ κατὰ πρέσβιν τε καὶ ὥς γεγάασιν ἕκαστος
ἀθανάτους ἐγέραιρε θεοὺς Διὸς ἀγλαὸς υἱὸς
πάντ' ἐνέπων κατὰ κόσμον, ἐπωλένιον κιθαρίζων.
τὸν δ' ἔρος ἐν στήθεσσιν ἀμήχανος αἶνυτο θυμόν.²

And in a lovely voice he sang along,
A full account about the deathless gods and murky Earth,
How first they came to be and how to each there came his lot.
Memory he celebrated first in song of all the gods,
Mother of the Muses, for the son of Maia was *her* lot.
And the deathless gods—the splendid son of Zeus gave honor
Each according to their age, and manner of their birth,
Reciting all in proper fashion, instrument upon his shoulder.
And in his breast a helpless love possessed Apollo's heart.

As the infant delights in his new plaything, this song within a song is a query to the powers that be: Hermes ponders his place within the wide world, knowing that a new line must be added to the poets' list of allotments, for he is latest and last "according to age" (κατὰ πρέσβιν).

- 5.5 Apollo, of course, has his own domain prior to Hermes' birth. According to the poem's internal chronology, he is already a musical god, as we learn from Hermes' description of him as "knowing how to sing beautifully and well, in the proper

² *H. Merc.* 426-434.

fashion” (καλὰ καὶ εὖ κατὰ κόσμον ἐπιστάμενος ἀγορεύειν).³ In response to his brother’s prodigious musicality, Apollo himself asserts—somewhat petulantly, one might imagine—that he is *already* an attendant of the Muses:

καὶ γὰρ ἐγὼ Μούσῃσιν Ὀλυμπιάδεσσιν ὀπηδός.
τῇσι χοροὶ τε μέλousι καὶ ἀγλαὸς οἶμος ἀοιδῆς
καὶ μολπὴ τεθαλυῖα καὶ ἡμερόεις βρόμος αὐλῶν.⁴

For I *too* am a follower of the Muses of Olympus,
To whom the splendid path of song and choruses are dear,
And flowering lyre-play [μολπὴ] and the lovely rumble of *auloi*.

The antithesis of μολπὴ and αὐλῶν strongly suggests that the former be understood as lyre-music; its more usual (but vague) translation as “song and dance” is further excluded by the otherwise redundant mention of χοροὶ and ἀοιδῆς in the preceding

3 *H. Merc.* 479.

4 *H. Merc.* 450ff.

verse.⁵ What is strange, as Gemoll (1886) noted, is that stringed-instrument music should be acknowledged here when Hermes has only just invented the lyre!⁶

- 5.6 In fact, we have Apollo's unambiguous testimony that Hermes' lyre is not the first of all stringed instruments. Worried that the precocious toddler will usurp his own birth-right, Apollo bursts out:

δείδια Μαιάδος υἱὲ διάκτορε ποικιλομήτα
μή μοι ἀνακλέψης κίθαριν καὶ καμπύλα τόξα.⁷

Son of Maia, wily-minded messenger, I fear that

⁵ Gemoll (1886) *ad loc.*; cf. 475f.: ἀλλ' ἐπεὶ οὖν τοι θυμὸς ἐπιθύει κιθαρίζειν, / μέλπεο καὶ κιθάριζε. Bielohlawek (1924-5) showed that the radical meaning of μολπή is "play", as can still be seen from *Il.* 13.233: κυνῶν μέλπηθρα γένοιτο (cf. 17.255). Later the word came to be used more freely, and in Homer is variously seen to mean "dance", "song", or "song and dance". By the Archaic period, μολπή means specifically "song" (where stringed music is often implicit). I can find no parallel where μολπή must mean stringed-instrument music *only* without song. However, such a restricted meaning is not required here since the antitheses (αὐλὸς music, dancing and αἰδὴ) will admit the music of the citharode as a distinct category. The following passages illustrate the overlap of usage in the various terms for song, stringed-instrument music, and dance: *Od.* 1.152: μολπή τ' ὀρχηστὺς τε; cf. *Il.* 13.637; *Od.* 8.248: αἰεὶ δ' ἥμιν δαῖς τε φίλη κίθαρις τε χοροὶ τε; *Od.* 8.253: ὀρχηστῷ καὶ αἰδῇ; cf. *Od.* 14.464f.; 17.605; 18.304; *h. Ap.* 149; *Od.* 21.430: μολπῇ καὶ φόρμιγγι; *Od.* 4.17ff.: μετὰ δέ σφιν ἐμέλπετο θεῖος αἰδὸς / φορμίζων· δοιῶ δὲ κυβιστητῆρε κατ' αὐτούς, / μολπῆς ἐξάρχοντος; *Od.* 21.407: ἀνὴρ φόρμιγγος ἐπιστάμενος καὶ αἰδῆς; *Il.* 13.731: [δῶκε θεὸς] ἄλλω δ' ὀρχηστύν, ἑτέρω κίθαριν καὶ αἰδῆν; *Il.* 7.241: οἶδα δ' ἐνὶ σταδίῃ δηῖω μέλπεσθαι Ἄρηι; *Il.* 16.182f.: μελπομένησιν / ἐν χορῷ; *h. Ap.* 188: αὐτίκα δ' ἀθανάτοισι μέλει κίθαρις καὶ αἰδὴ.

⁶ Gemoll (1886), 244, which bears quoting in full: "Was hier unter *molpe* zu verstehen ist, kann kaum fraglich sein. Die Verbindung mit der Flötenmusik macht es wahrscheinlich, dass hier das Saitenspiel gemeint ist. Da nun aber das Instrument des Hermes offenbar das erste sein soll, so könnte man vielleicht annehmen, dass *molpe* hier s.v.a. tanz sein soll. Weil aber Chorreigen und Gesang in vs. 451 schon erwähnt sind, bleibt nur noch die Instrumentalmusik. Dass nun von Apollon ausgesagt wird, dass er sowohl Saitenspiel als Flötenmusik liebte, ist nicht wunderbar, aber dass, wo die Kithara eben erst erfunden ist, schon des Saitenspiels gedacht wird, das ist das Merkwürdige."

⁷ *H. Merc.* 514f.

You might steal from me the κίθαρις and angled bow.

Apollo's anxiety over his younger brother's acquisitiveness recalls a moment in his own prodigious childhood, recounted in the *Hymn to Apollo*, when he leapt from his crib to stake his own claim among the gods:

αὐτὰρ ἐπεὶ δὴ Φοῖβε κατέβρωσ' ἄμβροτον εἶδαρ,
οὐ σέ γ' ἔπειτ' ἴσχον χρύσειοι στρόφοι ἀσπαίροντα,
οὐδ' ἔτι δεσμά σ' ἔρυκε, λύνοντο δὲ πείρατα πάντα.
αὐτίκα δ' ἀθανάτησι μετηύδα Φοῖβος Ἀπόλλων·
εἴη μοι κίθαρις τε φίλη καὶ καμπύλα τόξα,
χρήσω δ' ἀνθρώποισι Διὸς νημερτέα βουλήν.⁸

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But Phoebus, when you'd finished off the godly provender,
Then the golden blankets could not hold you back,
And no bond restrained you any longer, and all ties were undone.
And at once to the immortals Phoebus Apollo pronounced:
Let me have as mine the κίθαρις and angled bow,
and I shall proclaim to men the unerring will of Zeus.

- 5.7 Apollo's defensive assertion in the *Hymn to Hermes* that *he* is the god of the κίθαρις—fittingly expressed in the same formulaic language with which he staked his original claim in the *Hymn to Apollo*, and epitomizing the ancient harmonic association of bow and lyre (4.14)—is echoed by the striking use throughout the poem of the verb (ἐγ)κιθαρίζειν (“to play the κίθαρις/κιθάρα”), despite the fact that, organologically speaking, it is actually the tortoiseshell λύρα that has been invented and is being played.⁹ In the Nicomachean catalogue (4.28), the same careful qualification was made: it is not the lyre as a class that Hermes invented, but “the one made from the tortoise” (τὴν λύραν τὴν ἐκ τῆς χελώνης). Other sources credit Apollo with playing a

⁸ *H. Ap.* 127-132.

⁹ *H. Merc.* 17, 423, 425, 433, 455, 475f., 510; cf. 499 and 509, where the λύρα is called a κίθαρις. Aristoxenus fr. 102, from his work on instruments (Περὶ ὀργάνων), distinguished the κίθαρις from the κιθάρα, equating the former with the λύρα, probably on the basis of these passages, and wishing perhaps to account for its seemingly interchangeable use in epic with φόρμιγξ.

'lyre' before Hermes finds the tortoise.¹⁰ This mythological conflict is reflected in two of Pausanias' descriptions. An altar at Elis was shared by Hermes and Apollo, the one having invented the λύρα, the other the κιθάρα, while on Mount Helicon there was a bronze of Apollo and Hermes "fighting for the lyre" (μαχόμενοι περὶ τῆς λύρας).¹¹

- 5.8 The tortoise-shell lyre was at least as ancient as other members of the family. Though it once seemed that the word was younger than κιθάρις or φόρμιγξ, being attested in Alcman and Archilochus,¹² the word for lyrist (λυράτας) has now come to light in a Linear B tablets from Thebes¹³—still more intriguing is its dual form *ru-ra-ta-e*, given the common Assyrian depiction of harp players in pairs. While it is likely that 'lyre' should be understood generically here—for the palace musicians are never depicted playing the tortoiseshell variety—actual fragments date the instrument to the Mycenaean period.¹⁴ Thus the organological distinction can hardly conceal any historical significance *per se*. And yet it is clear that the poet has contrasted the two instruments purposefully, and that a chronological point is being made. For in poetic diction it is the κιθάρις or φόρμιγξ, not the λύρα, which is intimately associated with the epic singers, of whom Apollo was patron. This is apparent throughout Homer, and is strikingly emphasized by the formulaic utterance κιθάριν καὶ καμπύλα τόξα used by Apollo to describe his own musical activities, in which he follows the Muses—the Muses of Olympus. Since the poet could hardly have claimed that Hermes invented all stringed instruments, it appears that, for the purposes of dramatic or rhetorical contrast, he has used an organological distinction as a means of further marking the actual καινοτομία of the instrument—the *seven consonant strings*. Consider the problem from the opposite point of view: the use of seven strings was never restricted to the tortoiseshell lyre. Archaic vase-paintings, like the seventh-century Melos

¹⁰ Lucian *DDeor.* 11.4, cited below; Paus. 8.31.3f. describes a relief of Pan with syrinx and Ἀπόλλων κιθαρίζων, bearing the inscription that "they are of the first gods" (εἶναι σφᾶς θεῶν τῶν πρώτων); [Orph.] *A.* 282; Isid. *Etym.* 3.22.2: *juxta opinionem autem Graecorum citharae usus repertus fuisse ab Apolline creditur* ("But according to the Greeks' belief, the use of the *cithara* is believed to have been invented by Apollo"), afterwards mentioning Hermes and the λύρα (3.22.8).

¹¹ Paus. 5.14.8-9; 9.30.1.

¹² [Hom.] *Marg.* fr. 1.3 (West); Alcman 140 *PMGF*: κερκολύρα; Archil. fr. 54.11, 93a.5 (West); Sapph. fr. 44.33, 103.9, 208 (Voigt); Alc. fr. 307c (Voigt); Stesich. 278.2 *PMGF*.

¹³ See Aravantinos (1996); Younger (1998), 18 n.42; Janko (communication).

¹⁴ See Younger (1998), 17f.

Amphora, regularly show the heptachordal φόρμιγξ and κιθάρα.¹⁵ Terpander too uses ἐπτάτονος φόρμιγξ, placing himself (as Pindar would do two centuries later) in the tradition of the Homeric singer—though he too must have known λύρα in a generic organological sense. For the word was not restricted to the tortoise-shell variety, as shown, for instance, by the fact that a λυροποιός made all types of lyres, there being no word *κιθαραποιός.

- 5.9 Again, as argued in the last chapter, the lyre and its tunings must be regarded as separable. The actual construction of the instrument detailed in this *Hymn*, with the physical ἄρμονία of shell, arms, and yoke (cf. 4.16-18), was doubtless a traditional theme; with its preponderance of complex detail, the scene is likely to be a relatively fixed, formulaic set-piece.¹⁶ Being concerned with the physical construction of the instrument, string number need not have been mentioned; as such the τόπος is of indeterminable age and potentially even Mycenaean in its ultimate origin. And yet string number *is* mentioned, and after all the ἄρμονία of the strings—whether seven, four, or some other number—is also a physical force, and was regarded, as we have seen, as the last stage of the instrument's construction (4.17). Many strands may be interwoven in oral-traditional compositions—this *Hymn* combines lyre, cattle-theft, and prophecy themes—and the resulting fabric need not be entirely consistent. Such compositions never exist in isolation, but belong to a network of related songs, each with its own complex history within the larger history of the tradition, and all continually growing together and separating.¹⁷ With no regard for historical chronology, the *Hymn* may fuse a standard lyre-building scene with the further invention of “seven consonant strings”—which is, after all, the final touch of the instrument.¹⁸

¹⁵ See Aign (1963), 100 fig. 69 = Anderson (1994), 16 fig. 13 = Wegner (1949), pl. 1c. The distinction between Apollo-κιθάρα and Hermes-λύρα reappears in e.g. D. S. 5.49.1-2, where Hermes gives a λύρα at the wedding of Cadmus and Harmonia, while Apollo plays the κιθάρα; Hygin. *Astron.* 2.7: *Apollo lyra accepta dicitur Orpheia docuisse, et postquam ipse citharam invenerit, illi lyram concessisse*; Lucian *DDeor.* 17.1; [Orph.] *Arg.* 382f.; Aristid. *Quint.* 2.19 (91.1ff.); Isid. *Etym.* 3.22.2 and 3.22.8.

¹⁶ On formulaic scenes, see Lord (1991), 88-91.

¹⁷ Lord (1980), 97; cf. 101: “The result is a fabric of great complexity and richness, when the weaver is sensitive to the nuances of his inherited material and the full possibilities of its poetic art.”

¹⁸ This may account for the variant θηλυτέρων over συμφώνους (*H. Merc.* 51). Hom. *Od.* 21.406-8 shows that sheepgut was a traditional technical detail within the lyre τόπος, but

5.10 We encountered the very same device in the Nicomachean lyre-catalogue (4.28-32). Once the distinction between the tortoiseshell λύρα and the lyre as a class has been made, the instrument is fitted out with seven-strings (κατασκευάσαντα ἐπτάχορδον). The failure to mention any αἰδός before Terpander shows that this is not an idle detail, but rather the essential point which binds together the various mythological and historical variants. (This is all the more intriguing now that the Mycenaean seven-stringed instrument is known to have been called λύρα, in sharp contrast to Homer's exclusive use of φόρμιγξ and κίθαρις; but this is probably an illusion of the evidence.) As in the *Hymn*, it is Hermes, not Apollo, who is the inventor. A related tradition is found in Diodorus Siculus, whose rationalizing account is, however, somewhat inconsistent. Hermes is said to have created a three-stringed λύρα, Apollo the κιθάρα.¹⁹ Yet elsewhere Hermes is made the inventor of the κιθάρα, "which Apollo first used in proper fashion".²⁰ Apollo's musical improvement must involve a different way of tuning; for, repenting his actions after the contest with Marsyas, the god "ripped the strings from the κιθάρα and destroyed the ἁρμονία he had discovered" (τῆς κιθάρας ἐκρῆξαι τὰς χορδὰς καὶ τὴν εὐρημένην ἁρμονίαν ἀφανίσαι).²¹ This tuning is then lost to the world, as Apollo "stayed away from the instrument's music for some time" (μέχρι τινὸς χρόνου τῆς ἐν αὐτῇ μουσικῆς ἀποστῆναι).²² Thereupon Hermes creates "the λύρα which is made from a tortoise" (τὴν ἀπὸ τῆς χελώνης λύραν)—shades of Nicomachus—and eventually Apollo's ἁρμονία reawakens as the Muses, Linus, Orpheus, and Thamyras rediscover four of the lost strings.²³ Thus Apollo had destroyed a heptatonic ἁρμονία, while Hermes'

epic themes and formulaic scenes still have all the flexibility of the individual formula, admitting a range of variation from performance to performance: see Lord (1980), 27.

- ¹⁹ D. S. 1.16.1, 5.74.5: τῆς κιθάρας εὐρετήν. For the archetypal three strings as the schematization of the Archaic heptachord, see further 9.39.
- ²⁰ D. S. 3.58.2: τὴν κιθάραν, ἣν Ἑρμῆν εὐρεῖν φασιν, Ἀπόλλωνα δὲ πρῶτον αὐτῇ κατὰ τρόπον χρῆσθαι.
- ²¹ D. S. 3.59.5; cf. Call. *Del.* 253f.: ἐνθεν ὁ παῖς τοσσάδσε λύρῃ ἐνεδήσατο χορδὰς / ὕστερον, ὅσσάκι κύκνοι ἐπ' ὠδίνεσσιν ᾄεσαν ('Hence the child [sc. Apollo] later bound that number [sc. 7] of strings to the lyre, as often as the swans sang upon his birth'); Avien. 2.618-622.
- ²² D. S. 5.75.3.
- ²³ D. S. 3.59.6: ταύτης δ' ὕστερον Μούσας μὲν ἀνευρεῖν τὴν μέσην, Λίνον δὲ τὴν λίχανον, Ὀρφέα δὲ καὶ Θαμύραν ὑπάτην καὶ παρυπάτην ('But of this [sc. ἁρμονία], the Muses later rediscovered μέση, Linus λίχανος, and Orpheus and Thamyras ὑπάτη and παρυπάτη').

original trichordal version—and the κιθάρα itself—endured. The reintroduction of the ἐπτάτονος ἁρμονία is thus once again allied with a dubious organological point, the invention of the tortoise-shell λύρα. Finally, Lucian agrees in making Apollo a citharist before Hermes' invention; the new-born god plays so well that "even *I* am jealous of him, though I have been pursuing the κιθάρα for ages" (κάμῃ αὐτῷ φθονεῖν πάλαι κιθαρίζειν ἀσκοῦντα).²⁴

- 5.11 We may suppose that these sources are all more or less dependent upon the *Hymn to Hermes*. That presents no surprise in itself. But, very importantly, it reveals the larger 'historical' context in which these authors thought the *Hymn to Hermes* should be interpreted. Even in later antiquity, the poem was believed to describe the invention of heptatony as against an earlier tradition of κίθαρις music. The recovery of this perspective is essential, for it is usual to deny any relationship between the seven-stringed lyre of the *Hymn* and the historical innovations of 'Terpander'. According to this view, the mention of seven strings reveals the poet's assumption that the lyre must appear thus.²⁵ Some scholars go on to infer, with circular logic, that the Terpendrean tradition itself is false; the final proof of this is seen to be the Mycenaean instruments of seven strings.
- 5.12 This reasoning is fallacious and begs the question. Why should Hermes' seven-stringed lyre not correspond to some new musical development? After all, this is exactly how it is presented. Obviously the poet's mention of seven strings must post-date the existence of seven strings. The dating of the *Hymn* is uncertain, but though it may have been composed as much as a century and half after Terpander's *floruit*, the μῦθος itself may be older—indeed, given the nature of epic, this is perhaps more likely than not, and this may take us back the necessary number of generations to the introduction of heptatony. Indeed, the last to forget a novel musical movement would be the αοιδοί. We have seen in the catalogue of Nicomachus an astonishingly deep account which was nevertheless written down seven hundred years after the *Hymn to Hermes*, and which very probably contains a true grain of Mycenaean memory. We must not assume, therefore, that the poet of the *Hymn* is not trying to tell us something of historical importance.

²⁴ Lucian *DDeor* 11.4.

²⁵ Barker (1982-9) 1.43 n. 18: "the present hymn must be considerably later than Terpander, since it assumes that a *lyra* will have seven strings"; cf. Allen/Halliday/Sikes (1936), 274-5: "the writer could not have attributed the seven strings to Hermes had not the *cithara* been long established in that form".

- 5.13 If in fact the Greeks' first encounter with stringed instruments was in heptatonic form (4.6), then the *Hymn* cannot recall Mycenaean heptatony, given that Apollo already claims to know the κίθαρις. That the Nicomachean compiler has Hermes give the heptatonic lyre to Orpheus need not distract us from this reading; clearly a divine inventor must be placed before all semi-divine and human figures, and that the instrument passes directly from Orpheus to Terpander with no mention of Apollo or Homer more than counters this issue of poetic license. Indeed, it appears that Nicomachus knew a complete mythological replication of the sequence usually associated with Terpander, for Boethius reports his view that, prior to Orpheus, music was simple and of four strings.²⁶ Here too the seven-stringed lyre is not the first stringed instrument, but an innovation against an early citharodic tradition.
- 5.14 Further internal evidence confirms that in the *Hymn to Hermes* it is not the lyre itself but its seven-strings which are novel. Take again Hermes' description of Apollo as καλὰ καὶ εὖ κατὰ κόσμον ἐπιστάμενος ἀγορεύειν. The language is formulaic, belonging to a larger family of expressions—what may be called a 'multiform phrase'.²⁷ Describing good workmanship generally, εὖ καὶ ἐπισταμένως must be regarded as a technical phrase in that it describes the "well and knowledgeable" execution of a τέχνη.²⁸ κατὰ κόσμον ("according to the cut") conforms to the image, but also has a specific musical application to the telling of ἔπη.²⁹ Variations of ἐπιστάμενος/-ως ("knowledgeable/-ably") also appear in passages of epic—hence lyre—expertise. Alcinous likens Odysseus to an αἰδώς who has told his tale ἐπισταμένως.³⁰ This musical simile predicts the archery contest, where the Odysseus,

²⁶ Boeth. *De inst. mus.* 1.20 (205.27-206.2): *simplicem principio fuisse musicam Nicomachus refert adeo, ut quattuor nervis constaret, idque usque ad Orpheum duravit* ("Nicomachus relates that at first music was so simple that it consisted of four strings, and this lasted until Orpheus"); according to Nicomachus this four-stringed lyre was also invented by Hermes: Boeth. *De inst. mus.* 1.20 (206.7f.); likewise, Macr. *Sat.* 1.19.15 contrasts the four-stringed lyre of Mercury with the seven strings of Apollo.

²⁷ Lord (1991), 27ff., 76.

²⁸ Cf. Hom. *Od.* 19.47, 20.161, 23.197; Hes. *Op.* 107.

²⁹ Hom. *Od.* 8.489: κατὰ κόσμον Ἀχαιῶν οἶτον αἶδεις; 8.492: ἵππου κόσμον ἄεισον; *h. Bacch.* 59: κοσμήσαι αἰδήν.

³⁰ Hom. *Od.* 11.367f.: σοι δ' ἐπὶ μὲν μορφή ἐπέων, ἐνὶ δὲ φρένες ἐσθλαί, / μῦθον δ' ὥς ὅτ' αἰδώς ἐπισταμένως κατέλεξας; compare 19.457: δῆσαν ἐπισταμένως, ἐπαοιδῇ δ' αἶμα κελαινὸν / ἔσχεθον ("they bound [*sc.* the wound] knowledgeably and with an incantation held back the black blood").

bending his bow, is compared to a “knowledgeable” citharist stringing his lyre—the Heraclitean exemplars suggesting perhaps that the hero’s success will restore his house to harmony:

ὥς ὅτ’ ἀνὴρ φόρμιγγος ἐπιστάμενος καὶ ἀοιδῆς
 ῥηιδίως ἐτάνυσσε νέῳ περὶ κόλλοπι χορδὴν.
 ἄψας ἀμφοτέρωθεν ἐυστροφὲς ἔντερον οἶός.
 ὥς ἄρ’ ἄτερ σπουδῆς τάνυσεν μέγα τόξον Ὀδυσσεύς.
 δεξιτερῇ ἄρα χειρὶ λαβὼν πειρήσατο νευρῆς·
 ἢ δ’ ὑπὸ καλὸν ἄεισε, χελιδόνι εἰκέλη αὐδήν.³¹

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As when a man, who knows both singing and the φόρμιγξ,
 Lightly stretches a string around a new tuning-strip [κόλλοψ],
 Fastening the well-turned sheep-gut from both ends,
 So Odysseus, in no great hurry, strung the giant bow.
 In his right hand grasping it he tried the string;
 And, like a swallow’s voice, it sang a beautiful accompaniment.

- 5.15 Here we find another technical formula which also appears in the *Hymn to Hermes*: ἢ δ’ ὑπὸ καλὸν ἄεισε(ν).³² The expression is mostly used of a “singing under” the lyre, i.e. with its accompaniment or along with it, as in the *Hymn*. This sense is inverted in the *Odyssey*, where it is the bowstring, rather than the performer, which is said to “sing under”; clearly the phrase was stable enough to support this sort of word-play. The invertibility of the expression is reflected in a variant reading of the *Iliad* which goes back to a learned debate of the third century B.C. between Alexandrian editors of Homer. Zenodotus’ emendation λίνος δ’ ὑπὸ καλὸν ἄειδε (“the flaxen string sang along beautifully”) parallels the *Odyssey* passage, while Aristarchus championed what may be taken as the standard usage—and what actually appears in the manuscripts of Homer: λίνον δ’ ὑπὸ καλὸν ἄειδε (“he sang the Linus-song beautifully to the instrument’s accompaniment”).³³

³¹ Hom. *Od.* 21.406-11.

³² *H. Merc.* 54, 502.

³³ Hom. *Il.* 18.570 with scholia (512f. Bekker). As Aristarchus pointed out, the same ambiguity appears in the expression “to sing the *paian*/to sing *Paian*” (e.g. Hom. *Il.* 1.472ff.).

- 5.16 The testing of the bowstring in Homer is paralleled in the *Hymn*, for when Hermes finished constructing his lyre, he “tried it with a pick” (πλήκτρῳ ἐπειρήτιζε). In each case the purpose is clearly to determine whether the string is properly strung (see further 7.48-52). This action is encapsulated in the fundamental definition of ἁρμονία as “for the string to be well and knowledgeably” (τὸ εὖ καὶ ἐπισταμένως εἶναι τὴν νευρὰν), considered in the last chapter (cf. 4.17). Most astonishing is the dactylic rhythm of the phrase as a whole (u |— uu|— uu|— —|— —|— —), and in particular εὖ καὶ ἐπισταμένως, with its attested epic parallels, in yet another technical musical context. This singular fusion of the poetic and the technical is, to the best of my knowledge, without parallel in the extant music theorists, nor is there any notice of a musical treatise written in poetry rather than prose. εὖ καὶ ἐπισταμένως is the key, a technical epic expression which gives us a rare glimpse of musical vocabulary from the oral period.
- 5.17 Is the overall dactylic rhythm of the definition coincidental, and only that of the formula significant, a sort of quotation or curious fossil situated within the more prosaic articular infinitive? Might one suppose the existence of technical definitions in verse, a canon cast in metre for mnemonic purposes by the αἰδοί? The parallels then are to the small handful of technical details in Archaic poetry, like those considered above, and the lyre-invention scene in the *Hymn to Hermes*. Even the Terpander fragment might hint at the existence of such a lost ‘genre’. When such epic expressions seem to be merely quasi-technical, or completely untechnical—like ἐπτα δὲ συμφώνους οἰῶν ἐτανύσσατο χορδὰς—it is not because the poets were groping towards an as yet unformed θεωρία. They are making quick and casual allusions which would, for other poets, call to mind a body of technical language and concepts; for the general audience these details would impart a technical flavor without obscuring the narrative. Analogous technical themes in epic are, for example, those of arming and ship building—like the lyre-building scene, these are also ‘harmonic’ (cf. 4.19-20).
- 5.18 But what is the ultimate source of the definition preserved by the Aristophanic scholiast? A music theorist or ἁρμονικός might quote an epic formula simply as a way of enhancing the tone of a discussion; such may have been the case with ἐπταπύλους τὰς Θήβας ᾠκοδόμησεν in the Nicomachean lyre catalogue (cf. 4.29). But if it is right that εὖ καὶ ἐπισταμένως has some specific relevance to the τέχνη of music, the ἁρμονικός could be integrating such vocabulary to maintain some continuity with earlier tradition. This curious definition of ἁρμονία might ultimately recall a shift from an oral to written θεωρία, a transition which seems to have begun in the late sixth

century with the writings of Lasus of Hermione.³⁴ Martianus Capella, who purports to represent the contents and organization of this work, implies that it brought the study of ἀρμονία to a wider, more popular audience;³⁵ and ἀρμονία as a musical tuning is first securely attested in a fragment of this author (cf. 4.14). Is it possible, since Lasus was himself a poet, that the metrical definition came from this very work, whether cast in verse by the author himself or simply committed to writing in traditional form? Musical literacy itself may well have begun in the Argolid at this time, as is shown by certain distinctive letter forms in the ancient core of the Greek notation system.³⁶ This is also when traditional oral composition was being transformed by the art of writing. The poet of the *Battle of Frogs and Mice*, for instance, makes a point of revealing his literate method.³⁷ Among the *Hymns*, the clearest example of literate interference is the *Hymn to Hermes* itself.³⁸

- 5.19 Taken together, these technical details hint at an oral θεωρία of the Archaic period (with roots in the Dark Age as attested by Homer), known to musicians who had mastered the pursuit of their τέχνη—what Alcman described as τὸ καλῶς κιθαρίσδεν (cf. 2.24). It is not simply the case, then, that Apollo already “knows how to sing well”. He is master of an existing idiom, characterized with special epic language reserved by his tradition to describe performers, performance, and other musical facts. In this light, consider a similar description of Hermes, who makes his debut “reciting all in proper fashion while playing the *cithara* from his shoulder” (πάντ’ ἐνέπων κατὰ κόσμον ἐπωλένιον κιθαρίζων).³⁹ Thus Hermes himself, despite being an innovator, sings his theogony within the bounds of established epic technique—the *Hymn* itself being, of course, a post-Hesiodic composition. Note that it is equally possible to construe κατὰ κόσμον with both κιθαρίζων and ἐνέπων, so that proper instrumental performance is included in the epic τέχνη—exactly as we find in Homer’s bowman-citharist simile (άνήρ φόρμιγγος ἐπιστάμενος καὶ ἀοιδῆς).

³⁴ *Suda* s.v. Λάσος: πρῶτος δὲ οὗτος περὶ μουσικῆς λόγον ἔγραψε. Note that the title of this work, often given as Περὶ μουσικῆς, may not be specified by the *Suda*.

³⁵ Mart. Cap. 9.936: *me Lasus, ex urbe Hermionea vir, mortalibus divulgaret* (“Lasus, a man from the city of Hermione, revealed me [sc. Harmonia] to mortals”).

³⁶ West (1992), 261ff. Cf. 7.57.

³⁷ [Hom.] *Batr.* 3.

³⁸ Janko (1982), 41f., 149.

³⁹ *H. Merc.* 433.

- 5.20 This fusion of old and new leads to a world of snarled styles. That Hermes first calls upon Memory as his patroness—“for she had the son of Maia as *her* lot (ἡ γὰρ λάχε Μαιάδος υἱόν)⁴⁰—locates his novel performance squarely within the ancient tradition of αἰοιδή—already in Apollo’s domain, as we have seen—while ἐνέπων lends it an epic tone. The newcomer is thus fusing the ancient epic style with his new seven-stringed tunings, just as Terpander is said to have set the ἔπη of Homer to “music”, i.e. the μέλη of Orpheus (cf. 2.33). And yet, though the poet describes heptachordal melic, the *Hymn* itself was composed within the living epic tradition. The composer’s perspective then—along with that of his audience—is exactly that of Apollo, regarding the seven-stringed novelty as a threatening intruder. At the time when the *Hymn* was composed, of course, the seven-stringed lyre was standard, and the epic tradition well on its way to being fossilized by the rhapsodes, the Homerids who merely recited oral-traditional texts which had been fixed in writing in earlier generations (cf. 2.36). This passing of the torch is reflected in the *Hymn* itself where, at the end of the ‘epic’, Apollo overcomes his suspicions and receives the seven-stringed lyre into his domain of κιθαρὶς καὶ καμπύλα τόξα—just as elsewhere he led Camus and Harmonia to their wedding with heptatonic accompaniment (2.19), and in Theognis the Muses claimed the beautiful bride as their own with an ἔπος (2.30). The poem represents the official sanctioning, from within the inherited tradition, of a musical trend which had, by the date of our composition, already saturated Greece. It bestows upon the new musicians the blessing of the elders.
- 5.21 There are a few precious details in the lyre-building scene which may help to link the Greek θεωρία of the Classical period with the imported diatony (see further 7.47-52). But there is less technical material in the *Hymn* which is relevant to the Orientalizing music. Speculation about the melic revolution is made less rampant if, as it seems, the Mesopotamian diatonic system was restricted to certain genres of music. As we have seen, in the song catalogue VAT 10101 the phases of the Symphonic Circle are associated with only two classes of composition, *šitru* and *irtu* (cf. 1.18, 6.17, 7.61). We do not know what *šitru* songs were, except that they could be performed by girls, and are associated in one text with the number seven—referring presumably to heptatony or even to the seven phases of the tuning cycle.⁴¹
- 5.22 But Mesopotamian heptatonic music was not limited to female performers or the *irtu* love-songs: the Assyrian victory parades from the Nineveh reliefs show curved harps,

40 *H. Merc.* 430.

41 Kilmer (1984), 75 n. 22.

angled harps, and winds playing in concert. This processional music must have been as elaborate and artificial as the *šitru* and *irtu* songs, composed within the conventions of the classical system of music glimpsed in the tablets. Further, we find the ZÀ.MÍ (Akkadian *sammû*: cf. 6.3) mentioned in connection with songs of divine praise,⁴² and this is confirmed by the Hurrian tablet fragments, of which the one complete composition is a cult hymn to the goddess Nikkal.⁴³ In Greece too this genre was considered proper to the lyre.⁴⁴ It is important, then, that the opening hymns used by later Greek citharodes were attributed as a corpus to Terpander (cf. 2.29).

- 5.23 Clearly the *irtu* lovesongs, which explored the complete rotation of the Symphonic Circle, will have been a type of personal lyric poetry. This is an important area of overlap with Archaic Greek melic, also associated predominantly with stringed instruments, and characterized by personal expression and innovative composition. Here too, where Erato was the presiding deity, lovesongs loomed large; according to some, the Lovely Muse also created hymns to the gods,⁴⁵ and this helps illuminate the curious dual nature of the Homeric Hymns, with their ancient diction now deployed in a melic context. In the *Hymn to Hermes*, ἔρως features as one of the new seven-stringed lyre's three primary associations:⁴⁶

ἀτρεκέως γὰρ ἅμα τρία πάντα πάρεστιν
εὐφροσύνην καὶ ἔρωτα καὶ ἡδυμον ὕπνον ἐλέσθαι.⁴⁷

For truly there are all three things to choose from at once:

⁴² Kilmer (1994), 463.

⁴³ Laroche (1968), hymn 6.

⁴⁴ Cf. Procl. *Chr.* ap. Phot. *Bibl.* 320a19f.: ὁ δὲ κυρίως ὕμνος πρὸς κιθάραν ἦδετο; schol. Hom. *Il.* 18.570 (512f. Bekker): οἱ πρῶτοι τοῖς θεοῖς μετὰ ᾠδῆς ὑποκιθαρίζοντες. For “sweet” string music, cf. Hom. *Il.* 13.637: μολπῆς τε γλυκερῆς; *h. Bacch.* 59: γλυκερὴν κοσμησάι ἀοιδήν; Pi. *N.* 9.3: ἀλλ’ ἐπέων γλυκὺν ὕμνον πράσσετε.

⁴⁵ *Anth. Pal.* 9.504.6ff. (Anon.): ὕμνους ἀθανάτων Ἑρατῶ πολυτερπέας εὗρεν . . . ἀρμονίην πάσῃσι Πολύμνια δῶκεν ἀοιδᾶς.

⁴⁶ Compare Cleonides’ tripartition of μελοποιΐα into three characters (ἡθη): διασταλτικόν, συσταλτικόν and ἡσυχαστικόν at 13 (206.3ff.), where the expressive range of each reveal some overlap with the functions given in the *Hymn to Hermes*; cf. also Aristotle’s tripartition of music at *Pol.* 8.4.1339a11ff.

⁴⁷ *H. Merc.* 447ff.

- 5.24 Εὐφροσύνη—which, according to Pindar, Cadmus enjoyed from his wedding to Harmonia⁴⁸—anticipates the frequent distinction in later sources between the edifying and mind-soothing powers of the Apolline lyre and the orgiastic λύσις of the vagrant-pitched αὐλός.⁴⁹ “Sleep” (ὕπνον) is a somewhat less common association.⁵⁰ There is besides the variant ὕμνον, a genre proper to citharodes. But the erotic aspect of this tripartition is emphasized through an extended trope, whereby Apollo enters into a passionate love affair with the Heptatonic Lyre. The conceit begins at 423, when Hermes first plays to himself: λύρη δ’ ἐρατὸν κιθαρίζων.⁵¹ Apollo comes upon them, and it is love at first hearing when his newborn brother delivers his Hesiodic theogony in a “lovely voice” (ἐρατὴ . . . φωνή).⁵² Apollo is overmastered by “inescapable love”—a common melic trope emphasized by the framing device ἐρατὴ . . . ἔρος⁵³—and his musical tastes undergo a sea change:

48 Pi. P. 3.98.

49 Cf. [Hes.] Sc. 281; A. fr. 57 TrGF; S. fr. 849 TrGF; Ar. Vesp. 131; E. Hel. 1351f., Ba. 120-34, HF 871-879; Hp. Epid. 5.81; PHib. 13.33f.? (cf. West [1992b], 21f.); Pl. Smp. 215b-c, Min. 318b-c, Cri. 54d, Arist. Pol. 8.6.1341a21f.: οὐκ ἔστιν ὁ αὐλὸς ἡθικὸν ἀλλὰ μᾶλλον ὀργιαστικόν; cf. 8.7.1342b1ff.; Thphr. fr. 726a-c (Fortenbaugh *et al.*); Men. Theoph. 27-28; Anth. Pal. 9.216.5 (Onestes): αὐλὸς δύσμουσος; Ath. 14.623f-624c; Aristid. Quint. 2.18-19; [Longin.] Subl. 39.2; Galen Smpt. 7.60f. Kühn; Aët. 6.8. For the Apolline vs. Dionysiac in general see Nietzsche, *The Birth of Tragedy*; Brown (1959), 157-178; in music specifically, see Dodds (1951), 64-101; Anderson (1966), 151f. In Tenedos it was allegedly unconstitutional for an aulete to enter the temple of Apollo: Heraclid. Lemb. Exc. polit. 22 (Dilts).

50 Cf. perhaps Alc. 3.1.5ff. PMGF, with Page’s conjecture καλὸν ὕμνιοισᾶν μέλος / . . . / [ὕπνον ἀ]πὸ γλεφάρων σκεδ[α]σεῖ γλυκύν; Ion of Chios 19F22 TGrF: ἀλλ’ εἴα, Λυδαὶ ψάλτριάι, παλαιθέτων / ὕμνων ἀοιδοί, τὸν ξένον κοιμήσατε [v.l. κοσμήσατε] (“Come then, Lydian harp-girls, singers / of archaic hymns, send the guest to sleep”); Xenophon connects the hypnotic and erotic powers of music (Smp. 3.1-2); Aristotle reports the common association of sleep, music, and drink (Pol. 8.4.1339a14ff.); Callistrat. Stat. 7.3 describes lions lulled to sleep by the lyre of Orpheus.

51 Cf. Stesich. fr. 278.2 PMGF: ἐρατᾶι φθεγγομένα λύραι. Earlier the tortoise has been called ἐρατεινὸν ἄθυρμα, “lovely toy” (40), and χέλυν ἐρατὴν (52, 153).

52 H. Merc. 426.

53 H. Merc. 426, 434.

ἀλλ' οὐ πῶ τί μοι ὦδε μετὰ φρεσὶν ἄλλο μέλησεν
οἷα νέων θαλῆης ἐνδέξια ἔργα πέλονται·
θαυμάζω Διὸς υἱὲ τὰδ' ὥς ἐρατὸν κιθαρίζεις⁵⁴

But my heart never felt like this for anything else of the type
That are tests of skill for young men at parties;
I am amazed, Son of Zeus, at how gorgeously you play these pieces!

5.25 Despite his ancient patronage of music, σκόλια or party-songs had never been much to Apollo's taste, a mythological reflection of their vulgar status and unworthiness of attention by the serious musician.⁵⁵ By contrast Apollo's protection of the epic τέχνη is well attested.⁵⁶ The seven-stringed lyre brings with it a more estimable form of popular music, for Apollo's sudden love-affair is occasioned by Hermes playing in the very manner of the young men who had previously won only disdain.⁵⁷ Naturally the Greeks had always had feasts with entertainment.⁵⁸ But the symposium in its Classical form appears to owe a considerable debt to the seventh-century fashion of imitating Assyrian aristocratic life.⁵⁹ Such events are frequent in Assyrian art, and musicians—string players in particular—are a typical feature; the court minstrel was held in high esteem.⁶⁰ Likewise, from the early Archaic period onwards, lyre and αὐλός are essential trappings of Greek and Etruscan banquet scenes. These instruments almost invariably have a complement of seven strings, and here there is every reason to suppose that the artists have taken care to render the instruments accurately. In a scene where Oriental trappings were a mark of status and distinction, heptatonic instruments were an important and authentic detail.

⁵⁴ *H. Merc.* 453-55.

⁵⁵ For ἐνδέξια ἔργα as σκόλια see Allen/Halliday/Sikes (1936) *ad loc.*

⁵⁶ Cf. Hom. *Il.* 13.731: [sc. δῶκε θεὸς] ἄλλω δ' ὀρχηστύν, ἐτέρω κίθαριν καὶ ἀοιδήν; *Od.* 8.488: ἦ σέ γε Μοῦσ' ἐδίδαξε, Διὸς παῖς, ἦ σέ γ' Ἀπόλλων; Hes. *Th.* 94f. ἐκ γάρ τοι Μουσέων καὶ ἐκηβόλου Ἀπόλλωνος / ἄνδρες ἀοῖδοι ἔασιν ἐπὶ χθόνα καὶ κιθαρισταί; *h. Ap.* 188: αὐτίκα δ' ἀθανάτοισι μέλει κίθαρις καὶ ἀοιδή; Call. *Del.* 5: Φοῖβον ἀοιδάων μεδέοντα.

⁵⁷ *H. Merc.* 55f.: ἐξ αὐτοσχεδῆς πειρώμενος, ἥτε κοῦροι / ἤβηται θαλίῃσι παραιβόλα κερτομέουσιν.

⁵⁸ See e.g. Hom. *Od.* 1.152; cf. ps.-Plut. *de Mus.* 1146e-1147a.

⁵⁹ See West (1997), 32.

⁶⁰ See e.g. Farmer (1957), 237ff.

- 5.26 Pindar's testimony that Terpander invented σκόλια now becomes much more suggestive.⁶¹ Perhaps this is related to his portrait of Terpander at Lydian banquets, where the gleeman seems to have acquired, and doubtless exchanged, new ideas about music (cf. 2.15, 3.1, 3.9). Perhaps he contributed to the feast novel heptatonic music in Assyrian style. Perhaps both Greece and Lydia were caught up in the same Assyrianizing fashion. Alcaeus, one of Terpander's successors in the Lesbian γένος, was likewise renowned for his drinking songs.⁶² Naturally, love-poetry would be appropriate in a symposiastic setting; or rather, these erotic drinking songs belonged to the larger domain of Erato.⁶³ The *Hymn*'s association of the seven-stringed lyre with the erotic and symposiastic finds a distinct echo in a σκόλιον of Bacchylides who, addressing a loved one in a symposiastic context, apostrophizes the seven-stringed lyre—and invokes "well-lyred Apollo".⁶⁴ Similarly, the author of another σκόλιον wishes he were a lyre, so that beautiful youths might embrace him.⁶⁵ More generally, however, much other Archaic lyric was composed for sympotic occasions.
- 5.27 Apollo, long a follower of the native Olympian Muses (Μούσῃσιν Ὀλυμπιάδεσσιν ὀπηδός),⁶⁶ has found a new art and a new Muse—one not previously known in Olympus:

θαυμασίην γὰρ τήνδε νεήφατον ὄσσαν ἀκούω,
 ἦν οὐ πῶ ποτέ φημι δαήμεναι οὔτε τιν' ἀνδρῶν,⁶⁷
 οὔτε τιν' ἀθανάτων οἱ Ὀλύμπια δώματ' ἔχουσι, 445
 νόσφι σέθεν φηλῆτα Διὸς καὶ Μαιάδος υἱέ.
 τίς τέχνη, τίς Μοῦσα ἀμηχανέων μελεδώνων;⁶⁸

⁶¹ Pi. fr. 126a (S-M) = ps.-Plut. *De mus.* 1140f: καθάπερ Πίνδαρός φησι, καὶ τῶν σκολιῶν μελῶν Τέρπανδρος εὐρετῆς ἦν.

⁶² Ath. 15.693f-694a; cf. 13.598b = Hermesianax fr. 7.47f. CA.

⁶³ Cf. Aristox. fr. 125 from the Σύμμικτα συμποτικά (= *Suda* s.v.σκολιόν) ἥδου γνῶμας καὶ ἐρωτικά σύντονα; note that σύντονα is suggestive of diatony, which was surely the easiest style for a Greek of basic musical education (cf. 7.20, 7.53-56). Plato's *Symposium* was the best setting for a continuous encomium of Love.

⁶⁴ B. fr. 20B.1ff., 50 (Snell).

⁶⁵ *Carm. conviv.* 17 (PMG 900).

⁶⁶ *H. Merc.* 450.

⁶⁷ Cf. S. *Ichn.* 144 (Maltese): ψόφῳ, τὸν οὐδε[ι]ς ἐπι[ώπο]τ' ἤκουσεν βροτῶν.

⁶⁸ *H. Merc.* 443-447.

For this new voice I hear is marvellous—
 A voice I say no mortal ever learned as yet,
 Nor any of the gods who have Olympian homes,
 Except for you, you son of Zeus and Maia. Thief!
 What art is this? What Muse of inescapable cares?

Οὔτε τιν' ἀθανάτων οἱ 'Ολύμπια δώματ' ἔχουσι recalls the epic invocational formula Μοῦσαι 'Ολύμπια δώματ' ἔχουσαι, typically used when the poet is requesting information.⁶⁹ That is, the Olympian Muses represent the store of knowledge available to the singers' collective Memory—Μνημοσύνη, mother of the Muses. The immediate appearance of τῖς Μοῦσα after this invites us to read the word literally as “Muse”, rather than merely the poetic “music”—although this meaning is clearly operative too. Apollo declares his ignorance about a form of music previously unknown to the reservoir of traditional Greek lore, a new Muse to inspire him.

- 5.28 Typical melic love causes as much grief as joy, while music brings εὐφροσύνη, peace of mind. The poet of the *Hymn* has amusingly combined these tropes. Answering to ἔρος ἀμήχανος (“inescapable love”) at 434—and noting Hermes as the “deviser” (μηχανιστᾶς) at 436—Μοῦσα ἀμηχανέων μελεδώνων, describing the new instrument, must mean “Muse who *causes* inescapable cares”. The old Olympian Muses, by contrast, were, in the words of Hesid, “forgetfulness of evils and stopping of troubles” (λησμοσύνην τε κακῶν ἄμπαυμά τε μερμηράων).⁷⁰ As he sang in his own theogony:

εἰ γάρ τις καὶ πένθος ἔχων νεοκηδεῖ θυμῷ
 ἄζηται κραδίην ἀκαχήμενος, αὐτὰρ ἀοιδὸς
 Μουσάων θεράπων κλεῖα προτέρων ἀνθρώπων
 ὕμνησιν μάκαράς τε θεοὺς οἱ 'Ολυμπον ἔχουσιν,
 αἴψ' ὃ γε δυσφροσυνέων ἐπιλήθεται οὐδέ τι κηδέων
 μέμνηται.⁷¹

⁶⁹ See Janko (1992) *ad* 16.112f. See e.g. Hom. *Il.* 2.484, 11.218, 14.508, 16.112; Hes. *Th.* 114f.: ταῦτά μοι ἔσπετε Μοῦσαι 'Ολύμπια δώματ' ἔχουσαι / ἐξ ἀρχῆς, καὶ εἶπαθ' ὅτι πρῶτον γένητ' αὐτῶν; fr. 1.1f. (M-W): Νῦν δὲ γυναικῶν φύλον ἀείσατε, ἡδυέπειαι / Μοῦσαι 'Ολυμπιάδες.

⁷⁰ Hes. *Th.* 55.

⁷¹ Hes. *Th.* 98-103.

For even if a person lives with sorrow in his freshly-grieving
 Soul and stabbing heartpain, still, a singer,
 Servant of the Muses, will sing the famous deeds of
 Ancient men, and the blessed gods who hold Olympus,
 And all at once that man forgets his worried mind [δυσφροσυνέων] and does not
 Think at all of troubles.

- 5.29 The idea recurs in the Homeric *Hymn to Apollo*. This scene, which also contains the harmonic circle dancers—the βητάρμονες of the *Odyssey* (cf. 4.22)—enhances our appreciation of the inverted τόπος in the *Hymn to Hermes*. For here we find Apollo accompanying the Olympian Muses as they once again soothe mortal cares:

εἶσι δὲ φορμίζων Λητοῦς ἐρικυδέος υἱὸς
 φόρμιγγι γλαφυρῇ πρὸς Πυθῶ πετρήεσσαν.
 ἄμβροτα εἶματ' ἔχων τεθυωμένα· τοῖο δὲ φόρμιγξ
 χρυσεῖου ὑπὸ πλήκτρου καναχὴν ἔχει ἱμερόεσσαν. 185
 ξυθεν δὲ πρὸς Ὀλυμπον ἀπὸ χθονὸς ὥς τε νόημα
 εἶσι Διὸς πρὸς δῶμα θεῶν μεθ' ὁμήγυριν ἄλλων·
 αὐτίκα δ' ἀθανάτοισι μέλει κίθαρις καὶ ἀοιδή.
 Μοῦσαι μὲν θ' ἅμα πᾶσαι ἀμειβόμεναι ὅπλ' καλῇ
 ὕμνευσίν ῥα θεῶν δῶρ' ἄμβροτα ἢδ' ἀνθρώπων 190
 τλημοσύνας, ὅσ' ἔχοντες ὑπ' ἀθανάτοισι θεοῖσι
 ζώουσ' ἀφραδέες καὶ ἀμήχανοι, οὐδὲ δύνανται
 εὐρέμεναι θανάτιό τ' ἄκος καὶ γήραος ἄλκαρ.⁷²

The most glorious son of Leto goes
 Towards rocky Pytho, playing on his hollow *phorminx*,
 Wearing clothes divinely fragrant; and his *phorminx*
 Has a lovely sound beneath his golden plectrum.
 Thence as a thought he goes Olympus-bound from earth,
 To Zeus' home amid the gathered group of other gods;
 And all at once the gods' concern is only *kitharis* and song.
 The Muses, all together, answer him with pretty voice,
 And sing the gods' divine advantages, and all the
 Sufferings which humans get from the immortal gods:
 Unwitting and unable to escape, they live and cannot

Find a cure for death, nor shelter from old age.

- 5.30 In this vision of εὐφροσύνη, Apollo and his *phorminx* dart to heaven “like a thought” (ὥς τε νόημα), and the gods dance far from mortal cares. The old Olympian Muses now seem content to share Apollo with his new mistress. This is not meant facetiously; for, returning to the *Hymn to Hermes*, as the theme of musical and sympotic eros is brought to its climax, Apollo takes the seven-stringed Muse, like a courtesan (ἑταίρη), in his knowledgeable embrace:

εὐμόλπει μετὰ χερσὶν ἔχων λιγύφωνον ἑταίρην
καλὰ καὶ εὖ κατὰ κόσμον ἐπιστάμενος ἀγορεύειν.⁷³

Holding the clear-voiced companion in his hands he played her sweetly,
Knowing well and beautifully how to sing in accord with the art (κατὰ κόσμον).

- 5.31 The image of the instrument with its seven-stringed music as a ἑταίρη, along with its quality of εὐφροσύνη, might suggest the later contrast between the αὐλητρίς who was hired cheaply for an evening’s entertainment at a symposium, and the more cultured courtesans with whom the wealthy dallied for months or years.⁷⁴ As we see in New Comedy, these geishas often entertained with the sophisticated music of the κιθάρα.⁷⁵ We recall Aristoxenus’ opinion that stringed-instrument music was a more refined and demanding art than that of winds.⁷⁶ No doubt the rustic musics he dismissed were, like the bucolic tradition adapted by Theocritus, fascinating in their own right, governed by their own laws and with very ancient repertoires. But Aristoxenus reveals the station of citharodic music within Greek musical life as a whole. Already in the *Hymn to Hermes*, there is emphasis on the training and skill required if the instrument were not to babble meaninglessly.⁷⁷ Central to this knowledge is the musical reality underlying Hermes’ testing of the seven consonant strings (see further 7.47-52). Like the ancient epic tradition, the new art is something to be learned κατὰ κόσμον, according to the formal conventions of the τέχνη:

⁷³ *H. Merc.* 478f.

⁷⁴ See West (1992), 26. The distinction was not absolute, for we know of cheap hired girls who played the *sambyke*: see West (1992), 77.

⁷⁵ E.g. Terence’s *Phormio*, adapted from the *Epidikazomenos* of Apollodorus.

⁷⁶ Aristox. fr. 95 = Ath. 4.174e; cf. 1.22.

⁷⁷ *H. Merc.* 486-8: ὅς δέ κεν αὐτήν / νῆις ἑὼν τὸ πρῶτον ἐπιζαφελῶς ἐρεΐνῃ. / μὰψ αὐτῶς κεν ἔπειτα μετήορά τε θρυλίζοι.

ὅς τις ἄν αὐτὴν
 τέχνη καὶ σοφίῃ δεδαημένος ἐξερεΐνη
 φθεγγομένη παντοῖα νόῳ χαρίεντα διδάσκει.⁷⁸

Whatever person makes
 Their inquiry with skill and training (σοφία, τέχνη), learning her,
 She teaches, sounding out all sorts of things which please the mind.

- 5.32 With the sudden switch to indefinite statement (ὅς τις ἄν), the poet looks past Apollo, broadening the audience to include those whom the god of κίθαρις καὶ καμπύλα τόξα represents—ἄοιδοί raised within the inherited Greek tradition—in an instructive proclamation. With patient study, the musician could become εὖ κατὰ κόσμον ἐπιστάμενος in the new art. The new heptatony is versatile, and can be used for παντοῖα, “all sorts”—theogony, lovesong, divine hymns, σκόλια, and more.⁷⁹ With διδάσκει, the seven-stringed lyre becomes a teacher, foreshadowing its nearly exclusive role in the fifth-century music lesson, where intellectuals like Damon taught well-bred Athenians to recognize fundamental musicological issues, like those to which Plato and Aristotle so lightly allude. The lyrist becomes an inquirer into a τέχνη whose intellectual delights are emphasized by νόῳ χαρίεντα—Apolline ideas which reach for the heavens, ὥς τε νόημα, through the teaching of the seven-stringed lyre. Here is an early archetype of the *musica speculativa* commonly associated with the seven-stringed lyre in Pythagorean tradition, and predicted as an Orientalizing ‘science’ by the mythological symbolism of Cinyras and the marriage of Cadmus and Harmonia (cf. 2.10, 2.19).
- 5.33 As for the heptatonic τέχνη, Greek music was so enriched by the seven consonant strings that in the late fifth century the comic poet Eupolis could still declare that “music is a rather deep and devious business” (μουσικὴ πράγμ’ ἐστὶ βαθύ τι καὶ καμπύλον),⁸⁰ while Anaxilas exclaimed:

⁷⁸ H. Merc. 482ff.

⁷⁹ Cf. Pi. N. 5.24f.: φόρμιγγ’ Ἀπόλλων ἐπτάγλωσσαν χρυσέῳ πλάκτρῳ διώκων ἀγεῖτο παντοίων νόμων.

⁸⁰ Eup. 366 K-A Note that καμπύλον glosses μουσικὴ specifically in terms of stringed instruments and consonance, for καμπαί were modulations occurring at consonant “road junctures”: see further 7.17.

ἡ μουσική δ' ὥσπερ Λιβύη, πρὸς τῶν θεῶν,
αἰεὶ τι καινὸν κατ' ἐνιαυτὸν θηρίον
τίκτει.⁸¹

Music is like Libya, by the gods!
It always produces some novel animal
Every year.

By then Terpander's heptatonic μέλη had long since absorbed and been absorbed by the inherited ᾠδή of epic. The new art was a fusion of Oriental and Greek elements, with the imported practice persisting as the foundation of ἁρμονική, which had become synonymous with the Muses' art itself—just as the Spartans were said to have been ignorant of 'music' prior to Terpander's sojourn there (2.38).⁸² The Greeks had invented Music.

81 Anaxil. fr. 27 K-A

82 Ps.-Plut. *de Mus.* 9.1134b-c; Ael. *VH* 12.50.

PART TWO

THE SYMPHONIC CIRCLE

6.0 The Babylonian Tuning Cycle

- 6.1 Part One presented the historical evidence in favor of an Orientalizing musical movement, and identified this with rapid innovations evident in the Greek melic music of the Archaic period. This led to the diversification of the inherited Greek tradition, broadly tripartite as typical of musical syncretism: the fossilization of Homeric ἔπη; the incorporation in its pure form of the imported diatony; and the eventual development of syncretic forms determined by the imposition of native features onto the foreign system. This lays the foundation for the more detailed correlation of the cuneiform musical tablets with the testimony of the Greek theorists and those musicographers who preserve evidence of technical nature. Until now I have argued as generally as possible; the following chapters are, unavoidably, quite technical.
- 6.2 Over the last forty years, a handful of scholars have collaborated in the discovery and reconstruction of an ancient Mesopotamian theory of music. The cuneiform tablets express formally a system of practical music, and are the oldest such documents yet known. Codified no later than the beginning of the second millennium B.C., the tradition has clear antecedents in the third millennium achievements of Sumer. Predominantly Akkadian, the tablets still make regular use of Sumerian terms, some of which are known from other musical contexts in the earlier period, such as the Shulgi praise hymns.¹
- 6.3 This stratification is seen most clearly in U.3011, a lexical list which places Akkadian terms side by side with their Sumerian equivalents. Although each of the tablets contributes more or less to the understanding of the others, U.3011 (see Appendix B for text) was fundamental in providing the names and arrangement of the strings of the *sammû* (Akkadian) or *zà.mí* (Sumerian), without which none of the other tablets could have been deciphered.² (Whether this instrument was harp or lyre is still debated,³

¹ See Krispijn's (1990) edition of Shulgi B; cf. Shaffer (1981), 82-83; Gurney (1994); Kilmer (1965), 261. Note also the Sumerian expression "tigi-7 music", which may refer to heptatony: cf. Kilmer (1984), 75 n. 22.

² British Museum. Publication history: Kilmer (1960); Kilmer (1965); official publication by Gurney (1974) as no. 126 of *Ur Excavation Texts* VII, British Museum (1974); Finkel/Civil (1982); Kilmer (1994).

³ See Duchesne-Guillemin (1969a), 10f.; (1969b); Lawergren/Gurney (1987), 40ff.; Gurney (1994), 104; Crocker (1997) 191f.; new evidence for the *sammû* as a lyre was presented in a paper by Kilmer at the Ninth International Symposium of the Study Group on Music

but this is unimportant for the present argument.) Discovered at Ur and dating to the neo-Babylonian period (c. 400-300 B.C.), U.3011 is among the last generations of cuneiform tablets. But the text itself of column 1 was shown to be much older by the discovery of a duplicate fragment from Nippur, N4782, dated to c.1800-1500.⁴ In fact, U.3011 and N4782 are but two exemplars of the thirty-second and last surviving (i.e. identified) volume of a much larger work known as *Nabnītu* (“Creation” or “Creature”), an encyclopaedia of the Old Babylonian period (c. 1800) which treated all aspects of human action and creation.⁵ While the first thirty-one volumes were devoted to human physiology, *Nabnītu* XXXII marks a sudden change in direction, containing a variety of musical terminology, much of which is fragmentary and as yet undeciphered. It is thus the oldest known example of music lexicography.⁶

6.4 The first column of *Nabnītu* XXXII is best preserved, being witnessed by two of the three exemplars. The text seems to be divided in halves, the first containing the string names of the nine-stringed *sammû*. These are subdivided into two groups and given numbers from one to five, one set being distinguished by the label “behind” or “back”. The two groups share a single fifth string upon which the lower-numbered strings converge. This arrangement of strings, often represented as 123454321, may be termed ‘epicentric’. The second half of the text is generally considered a section apart—or rather, no attempt has been made to correlate the two halves. But a close relationship between the two is, I shall argue, important for a fuller understanding of the system (10.37).

6.5 Following the nine epicentric strings is what appears to be a summary statement in Line 10:

Sumerian:	Akkadian:	Translation:
[9] SA.A	9 <i>pi-it-nu</i>	“nine strings”

Archaeology (1998), the proceedings of which will be published by the Deutsches Archäologisches Institut (Berlin).

4 University Museum, Philadelphia. Publication history: Shaffer (1981); Finkel/Civil (1982); Kilmer/Crocker (1984); Kilmer (1994). Shaffer, who published the tablet, considered it Old Babylonian, while Finkel believes it to be Middle: Finkel/Civil (1982), 250.

5 For *Nabnītu* as a whole see Finkel/Civil (1982). The subsequent volumes cannot yet be identified, since the colophon of U.3011 does not survive.

6 Cf. Coover/Franklin (2001).

Akkadian *pitnu* corresponds to two Sumerian words. Here and in other texts it is seen to be synonymous with Sumerian SA, the musical string; it can also mean both “interval” and “tuning”, as seen from the other tablets.⁷ But *pitnu* also has a common non-musical application, corresponding in this sense to Sumerian GIŠ.NA₅: a well-attested but “as yet undetermined wooden piece of craftsmen’s equipment and certain parts of furniture and other furnishings . . . the relationship between the stringed instrument and the wooden furnishing remains unclear.”⁸ Based on the pictograph of NA₅, Kilmer (1965) suggested that GIŠ.NA₅ might mean the rungs or staves of wooden furnishings, since this could serve as an appropriate metaphor for musical strings.⁹

- 6.6 This dual application to woodworking and musical strings finds a striking parallel in the Greek term ἀρμυρία, leading to a metaphor of “musical joinery”. We have seen that the ἀρμυρία of the strings’ tuning is quite literally equivalent to the overall harmony of the instrument (4.17). The precision required to ‘build’ a tuning upon the narrow resonant nodes is aptly paralleled by the delicate balance required in complex joinery work, often associated with ἀρμυρία (4.19-20). Where many such consonant ‘joints’ are involved, as in the diatonic method, the image becomes ever more apt as the tuning comes to be seen as an elaborate, mutually supporting structure. Here the semantic overlap of ἀρμυρία and Akkadian *pitnu*, both of which may pertain to a variety of composite wooden objects of some complexity, including cross-supports in chairs and beds, is especially intriguing (cf. 4.18). In this light we should entertain Kilmer’s proposed derivation of *pitnu* from √ptn, “to strengthen”.¹⁰
- 6.7 The use of Akkadian *pitnu* as both “a tuned string” and “an interval comprising two tuned, i.e. consonant strings”, is closely paralleled by the two musical uses of

⁷ See Kilmer (1960), 278, 281, 298-300; (1965), 262-265; (1971), 132.

⁸ Parallels where *pitnu* is equivalent to GIŠ.NA₅ collected by Kilmer (1965), 262ff., supplementing Landsberger (1934), 155f.; Salonen (1963), 207f.; cf. Kilmer (1971), 133 n.1, which also gives the NA₅ pictograph.

⁹ This might find a parallel of some sort in Telest. fr. 4.2f. (PMG 808) = Ath. 14.637a: “magadis in five-rodged juncture/harmony of strings” (μάγαδις / πενταρράβδω χορδᾶν ἀρθμῶς). I am not suggesting an immediate relationship between the five rods of Telestes and the five strokes of the NA₅ sign, though it is a curious coincidence. The point of interest is rather the conjunction of woodworking and musical imagery.

¹⁰ Personal communication.

ἄρμονία recorded in the *Suda* (τὸ εὖ καὶ ἐπισταμένως εἶναι τὴν νευρὰν and ἔστι δὲ ἄρμονία συμφωνία τῶν χορδῶν: cf. 4.17). Moreover, the common use of ἄρμονία as “tuning” matches the tertiary sense of *pitnu* as “a full tuning using consonant strings”. As far as we know, *pitnu* always describes a diatonic tuning, and this provides an important precedent for the early use of ἄρμονία as “diatonic octave species”. As we have seen (2.20-21), τόνος has a very similar range of meaning—also with diatonic overtones—from “pitched string” (τάσις) to “interval” (διάστημα) to “tuning”, applying to both the diatonic tuning and the octave species. διάτονος itself is revealing in this light, for the word has a literal use in construction contexts, and refers specifically to strengthening devices, applying for example to a particular type of stonework or to the stays of furniture.¹¹

- 6.8 Though U.3011 was not formally published by Gurney until 1974, Kilmer (1960) was able to consult his hand-transcription for her work on CBS 10996, which would have been all but unintelligible without the string names. (See Appendix B for text.) This was an Akkadian mathematical text from Nippur, an important scribal center, dating to the middle or late first millennium B.C.¹² Such coefficient lists, as they are called, were not uncommon; but CBS 10996 was unique in that its partially destroyed first column contained a list of musical strings, in a mysterious but obviously purposeful arrangement.
- 6.9 Each string name appeared in company with a number; but these numbers did not always correspond to those upon which the strings’ names were based in U.3011. Front-string, next-string, third-thin-string, Ea-creator-string (equated with Sumerian fourth-small-string in the lexical list of U.3011), and fifth-string were predictably answered by 1, 2, 3, 4 and 5. But for some reason fourth-back-string and third-back-string were given the numbers 6 and 7; moreover, the remaining two strings known from U.3011—second-back-string and back-string—were not to be found. Equally curious, the string names and their attendant numbers appeared in various pairs, compiled in list format; each had a unique and mysterious label, such as “upright”,

¹¹ Vit. *de Arch.* 2.8.7; cf. Blüner (1884), 3.144f. Cf. 2.26.

¹² University Museum, Philadelphia. Publication history: Kilmer (1960); Kilmer (1965); Güterbock (1970); Kümmel (1970); Kilmer (1971). Originally thought to date from the Kassite period, mid-second millennium B.C. (Kilmer (1965) 273), a Neo-Babylonian date is now accepted on the basis of orthography and other internal evidence: Kilmer (1974) 70 n.4. Its provenance is given erroneously as Sippar in Kilmer (1974), 70: see Kilmer (1984) 69 n.1.

“flute”, and “covered”, though many of these could not then be securely read. Indeed, these words continue defy interpretation because musical terms are are often subjectively created “on a far-fetched or whimsical basis”.¹³

- 6.10 Further restoration of this difficult text clearly depended on an understanding of its musical and/or mathematical content. The first breakthrough came with M. Duchesne-Guillemin’s hypothesis, based on the appearance of seven string names in lines 11-24 (rather than the full nine known from U.3011), and the lack of any corresponding number above 7, that the tablet concerned a heptatonic, diatonic scale. Such scales may be created by the process called—anachronistically, as it would turn out—Pythagorean tuning: that is, through the concatenation of consonant fourths and fifths or fifths and fourths. This procedure yields a scale which is more or less like the ones used in our own classical music, small details of intonation and temperament aside. But since many other heptatonic scales have been documented, most notably by Aristoxenus for the Greeks, this was a rather bold initial assumption—its eventual correctness notwithstanding.
- 6.11 Now, according to Duchesne-Guillemin’s hypothesis, it followed that the string pairs should be intervals drawn from the diatonic scale. With these assumptions, the previously baffling internal evidence was now constrained by several parameters, and this soon led to the realization—and, happily, proof of the initial assumption—that the sequence of interval pairs proceed according to a heptatonic cycle, discussed below. When once this cycle was detected, J. Duchesne-Guillemin could notice that the numbers in lines 6-10 were largely the same as those of lines 20-24: it seemed that the first part of the text originally contained at least one repetition—or rather prediction—of the complete interval cycle seen in lines 11-24. This was shown to be correct as comparison of the two halves of the text, each partially damaged, led to improved readings throughout.¹⁴
- 6.12 The interval list of CBS 10996 is constructed as follows.¹⁵ The first interval in the cycle (line 11) is one of five strings or a fifth: front-string (=1) and fifth-string (=5). The second (line 12) is of three strings or a third: fifth-string (=5) and third-of-the-behind-string (=7). Note that the same string serves as both the second string of the first interval and the second string of the second interval (fifth-string). Following this

¹³ Crocker (1997), 190.

¹⁴ See Kilmer (1965) 265f.; (1971), 134.

¹⁵ Duchesne-Guillemin (1963); (1965); Kilmer (1965), 265f.

are six other such pairs, the first string of the first interval in each beginning successively on strings 2-7, that is, on each succeeding step of the diatonic scale (lines 13-24).

- 6.13 But it is in the other strings of each interval-pair that the heptatonic cyclicity is clearly seen. As the sequence progresses, the numbers assigned to these strings ought quickly to have exceeded seven, if the pattern of the first interval-pair were to be followed strictly on each of the seven steps. That is, where the first interval pair of fifth-third is 1-5 and 7-5, we should expect the second pair of fifth-third to be numbered 2-6 and 8-6. But this is not the case; rather 8 is replaced by 1. Likewise in the third pair we have 3-7 and 2-7 rather than 3-7 and 9-7. All numbers have been 'reflected' at the octave to stay within the span of the diatonic scale. Clearly, two pitches an octave apart were regarded as the same in some sense, a natural enough perception of the first resonant interval—one shared by ourselves and the Greeks, whose term for this phenomenon was ἀντίφωνος, "responding" (cf. 8.42-48, 8.56, 10.6).
- 6.14 This octave-responsion has a further aspect: where one of the intervals in the list contains such a reflected pitch, the effect is, in our terms, the inversion of the interval. Thus, as the list progresses, the fifths and thirds are replaced respectively by fourths and sixths. Like the antiphonal octave, these must have been seen as equivalents in some sense or for some purposes, an inference which is proven by UET VII 74 col. ii (see below). Realize that, in order for the structure of each interval pair to remain parallel through the course of the cycle and across the octave-reflection, the heptatonic scale in question *must* be derived from a concatenation of consonances: that is, it must be diatonic.
- 6.15 Given the state of CBS 10996, fragmentary and corrupt as it was, these first breakthroughs should not be underestimated. Yet many questions remain about this text. Why does the cycle repeat twice? Why only twice? Or was there a further repetition or prediction in what has been lost?¹⁶ Why does the first cycle simply contain numbers while the second also has the string names? Why does the tablet give thirds, fourths, fifths, and sixths but not seconds and sevenths?¹⁷ What do the strange names of each interval mean in connection with the music system as a whole?

¹⁶ Cf. Kilmer (1965), 267.

¹⁷ Cf. Crocker (1978) and below.

Most important, what was the purpose of the text?¹⁸ Why is a cyclical interval sequence found among the coefficient lists? Is it itself a kind of coefficient list? (see further 10.7-10).

- 6.16 It is important to remember that, as with U.3011, what can be deduced about CBS 10996 is not necessarily its original purpose or meaning. Probably it is not. To date, U.3011 has only served to apprise us of the string names, knowledge which led in turn to some understanding of other texts which use those names; this makes it an important text for us. But obviously one cannot assume that the text was important to the Babylonians for the same reason—to set forth the names of the musical strings to assist in reading the other tablets. Likewise, CBS 10996 has been useful for understanding the larger system because it is the only text which defines the interval names, found in other texts, as exact positions within a diatonic pitchset. We use it as an interval list; but that cannot be its sole purpose.
- 6.17 The next advance came with Kilmer's discovery that seven of the interval names from CBS 10996 were also to be found in VAT 10101, a tablet which had been known since 1919, but whose connection to a larger musical system had naturally not been recognized when it was first published.¹⁹ A Middle Assyrian tablet from late second-millennium Assur (c.1100),²⁰ VAT 10101 is a long catalogue of more than 360 musical titles, both songs and instrumental compositions. These titles, Akkadian and Sumerian, are divided into thirty-two types. In the eighth column of the tablet is a section (lines 45-52) which summarizes the total number of songs belonging to the category of "breast songs" (*irtu*), which, judging from the titles themselves, are personal lovesongs.²¹ This total is further divided into seven subtypes whose names had remained a mystery since the tablet was first published. As it now turned out, these seven names were, with some orthographical differences, the same as the seven

18 Smith/Kilmer (forthcoming) argue that the text is used for establishing a kind of equal temperament.

19 Pergamon Museum, Berlin. Published by Ebeling (1919), no. 158, whence it is referred to as KAR 158 in much of the earlier musical bibliography cited here. Further restorations by Kilmer (1965), (1971). For this text in general see Kilmer (1965), 267; (1971), 138; Kilmer/Crocker/Brown (1976), 5; Kilmer (1994), 468, 475.

20 Kilmer, Crocker, and Brown (1976) 5.

21 On "breast-songs", see further Held (1961); cf. Kilmer (1971), 138 n. 24; (1994), 475. On the place of these diatonic songs in the larger musical tradition, see also 1.18, 5.21-3, 7.60-61.

consonant fifths and fourths (i.e. inverted fifths) known from CBS 10996; comparison led to better readings in both texts.²² The catalogue is in the form (number)+(irātu, “of love songs”)+(tuning name):

VAT 10101 col. viii.45-52

TEXT:²³

TRANSLATION:

45.	23 irātu ša e-šir-te Akkadī KI	45.	23 love-songs in <i>išartu</i> tuning, Akkadian
46.	17 irātu ša ki-it-me	46.	17 love-songs in <i>kitmu</i> tuning
47.	24 irātu ša eb-bu-be	47.	24 love-songs in <i>embūbu</i> tuning
48.	4 irātu ša pi-i-te	48.	4 love-songs in <i>pītu</i> tuning
49.	[] irātu ša ni-id MURUB ₄	49.	[] love-songs in <i>nīd qabli</i> tuning
50.	[] irātu ša ni-iš GAB.RI	50.	[] love-songs in <i>nīš gabarī</i> tuning
51.	[] irātu ša MURUB ₄ -te (= <i>qablīte</i>)	51.	[] love-songs in <i>qablītu</i> tuning
52.	[<i>napḫar</i> x irātu Ak-ka-d]u-ú	52.	[total number of love-songs,] Akkadian

6.18 Though the names do not occur in the sequence of CBS 10996, the order in which they are listed does exhibit a pattern relative to it. VAT 10101 begins with *išartu*, which appears in CBS 10996 as the second interval of a fifth. The list then proceeds as though every fifth interval were being extracted from CBS 10996, counting continuously around the octave-reflection. To view it another way, the names are chosen by alternating fifths and fourths; and this order seems somehow significant, echoing as it does that of the diatonic tuning process. Thus, each list followed its own logic, and though neither could explain the other; the two hinted at some larger, unified system.

6.19 The more pressing question at the time was why a musical composition should be classified according to the name of an interval from the diatonic scale. The natural inference was that the songs had been grouped by some ‘tonal qualifier’, analogous perhaps to our ideas of key or mode;²⁴ but how and why this classification could be based upon a single interval remained a mystery until the discovery of UET VII 74. A fragmentary Akkadian text from Ur, this was the oldest musical tablet yet discovered at the time of its publication in 1968, dating to the Old Babylonian period (c.1800

²² Kilmer (1965), 266 n.41; Kilmer (1971), 137f.

²³ Text and translation following Kilmer (1971), 138.

²⁴ Kilmer (1965), 268 n.60; Duchesne-Guillemin (1965), 272, (1966), 154-157.

B.C.).²⁵ Since UET VII 74 shared much of the terminology found in the younger tablets, it proved conclusively what had merely been inferred, the astonishing continuity of Mesopotamian classical music as expressed through a corpus of technical terms virtually unchanged over a millennium and a half or more.²⁶

- 6.20 Parts of two columns survive, both substantially effaced, and each containing the remnants of a musicological 'treatise'. These texts are distinct, but share kinship with the larger system hinted at by CBS 10996 and VAT 10101, as shown by common terminology; the immediate relationship between the two columns—if there is one—has remained unexplored, but may be a rewarding area of study. The left-hand column (col. 1), elucidated by Crocker (1978), is a catalogue of intervals—the fifths, fourths, sixths, and thirds known from CBS 10996—organized by common strings; it is suggested that these have been listed together as being the more resonant intervals. Any specific musical function remains obscure, although all the interval types occur in the undeciphered Hurrian Hymns, where they have been interpreted for instance as simultaneous dichords.²⁷ We might seek a parallel in the Indian classification of intervals into the *samvada* or "consonant" (i.e. the fifth and fourth) and the less resonant *anuvada* or "assonant" [*sic*], which described all other intervals—including perhaps the resonant major and minor tones (7:6 and 8:7)—besides the semitone, which were called *vivada* or "dissonant". Fox-Strangways (1914) held that these terms were "survivals of a theory of consonance (*samvāditva*) now forgotten", predating Bharata's *Nāṭyaśāstra* where they are first attested.²⁸ This is conceivable if one accepts Picken's argument that India—or even the Indo-Iranians in the second millennium B.C.²⁹—fell within a continuum of Mesopotamian musical influence (cf. 1.10).

²⁵ Publication history: Gurney (1968), *editio princeps*; Kümmel (1970); Gurney (1974), handcopy; Kilmer/Crocker/Brown (1976); Crocker (1978) with Kilmer; Shaffer (1981); Krispijn (1990); Gurney (1994). The tablet will be found as U. 7/80 in much of the past scholarship: this original British Museum designation became obsolete when the tablet was returned to the Iraq Museum in Baghdad, where it was renumbered: Gurney (1994), 101.

²⁶ UET VII 74 was later joined by other Old Babylonian tablets, N4782—according to Shaffer's (1981) dating, see above—and the "hymnodic instructions": Kilmer/Civil (1986).

²⁷ Kilmer (1974).

²⁸ Fox-Strangways (1914), 108. For this treatise, see 3.26.

²⁹ We find a seven-stringed *yna* already in the *Ṛgveda*, and nine-stringed instruments regularly mentioned elsewhere (Bhattacharya [1968] might point back to early Bronze Age—i.e. Indo-Iranian—contact with Mesopotamian music.

- 6.21 The right-hand column (col. 2) is by far the better preserved, and Wulstan (1968) was able to offer a cogent musicological analysis in time to accompany Gurney's initial publication of the tablet. Divided by line 12 into two 'chapters' (see Appendix B for text),³⁰ the first contains a formula for changing the *sammû* from one tuning to another. According to Gurney's (1994) revised scheme:

If the *sammû* is (tuned as) X
and the (interval) Y is not clear,
you tighten the string N
and then Y will be clear.

The second chapter reverses the process, guiding the reader backwards through the tunings of the first:

If the *sammû* is (tuned as) X
and you have played an (unclear) interval Y,
you loosen the string N
and the *sammû* will be (in the tuning) Z.

- 6.22 Here were found, in positions X, Y, and Z, the same peculiar names that had qualified consonant fifths and fourths in CBS 10996 and groups of lovesongs in VAT 10101. Moreover, it could be seen from what remained that these names occurred in the same sequence as they had in VAT 10101. Since the instructional quatrains followed a consistent pattern within each chapter, and since the list of VAT 10101 was complete, it was possible to reconstruct the text in its entirety—noting the disagreement as to how extensive the entire text should be (cf. 6.31, 10.35-37). The mystery of VAT 10101 was now resolved, since here it could be seen that the seven consonant interval names known from CBS 10996 could also designate tunings; and this would be a useful criterion by which to classify songs and compositions. Yet the mystery was only displaced, since there was now the problem of how the same name might designate both tuning and interval.
- 6.23 This problem did not prevent a full understanding of the treatise itself. Indeed, in the single most impressive musicological breakthrough the subject has seen, Wulstan

³⁰ For the controversy surrounding line 12, see Gurney (1994), 101f.; Crocker (1997), 189-92; Gurney/West (1998), 223f.

(1968) demonstrated that the “unclear” interval must mean the tritone, and that “clearing” the tritone by making it consonant signaled the conversion of one diatonic tuning to another. The tritone is a series of three wholetones (hence its name) or six semitones³¹ which occurs as a sort of nonconsonant remainder between the first and last of seven pitches tuned by the diatonic method. For instance, if one begins tuning from B₃, proceeding through the alternation of ascending fourths and descending fifths, the following series of pitches will be generated, in this order:

$$B_3 > E_4 > A_3 > D_4 > G_3 > C_4 > F_3$$

Among the various ‘fourths’ and ‘fifths’ of this set—that is, those pitches which are four positions away from each other—the interval B₃-F₃ is alone in comprising three wholetones; the rest are consonant. This unique tritonic interval may be better seen perhaps when the series is rearranged in order of pitch (here shown descending), though in general it may be better to avoid such scale-like representations:³²

$$E_4-D_4-C_4-B_3-A_3-G_3-F_3$$

- 6.24 We would call such a tritone an augmented fourth, since it comprises four steps of a scale; the other consonant fourths also span four steps, but comprise two wholetones and a semitone (five semitones rather than six). Now, if the same pitch-series is continued through a further octave another tritonic interval is found as the inversion of the first (F₄ + E₄-D₄-C₄-B₃-A₃-G₃-F₃). This is in keeping with the octave-reflection acknowledged by CBS 10996, and accordingly the Mesopotamian musician called both intervals by the same name, as can be seen from UET VII 74 col. ii (see below). For our part, we distinguish the augmented fourth from its inversion, calling it a diminished fifth, since it spans five steps of a scale rather than four; the other fifths in the pitchset are perfect or consonant, also spanning five steps, but comprising three wholetones and a semitone (seven semitones).

³¹ The definition of intervals by semitones is artificial in the context of a single heptatonic scale. But in the course of the tuning cycle the pitch continuum is in fact divided evenly by semitones. It is, therefore, a useful and non-anachronistic unit of measurement.

³² Cf. Crocker (1997) 194: “Scales are a way of displaying the results of a tuning process—a simple way, with pitches arranged in ascending and descending order . . . In the tuning systems used in Mediterranean-European tradition, the tuning is produced by some order other than the scalar one: in the diatonic tuning assumed here the order is by fifths, and this is the real determinant of the pitches; the scale is merely the result”.

- 6.25 Since the tritone is, relative to the consonances, much less resonant—it is in fact one of the more dissonant intervals—the metaphor of “clear” and “unclear” is aptly chosen: like undisturbed water, consonance is clear of the non-resonant rippling that clouds other intervals. A similar metaphor is found in the Greek term χρῶμα (“coloring”), which marks a deviation from an “uncolored” norm, i.e. the diatonic scales which were, as I shall argue in the next chapter, the basis of the earliest Greek theory. This is important for understanding the syncretic interaction of the Greeks’ native tradition with the Orientalizing heptatony, as codified in the doctrine of the genera.
- 6.26 Wulstan’s achievement was to show how the tablet instructs the reader to proceed from one diatonic tuning to another by clearing the unclear tritone. This is done by a semitone adjustment of one of the interval’s two strings, and its resulting resolution to a consonant interval: a diminished fifth is widened to become a perfect fifth, or an augmented fourth is narrowed to become a perfect fourth (depending on one’s place in the tuning cycle). Clearing the tritone has the corollary of creating a new tritone between two strings that were previously consonant, since, axiomatically, there can and must exist one, and only one, tritone in a diatonic pitch-set. When the tritone migrates to its new location and the overall interval structure of the pitch-set shifts, a new diatonic tuning emerges.
- 6.27 In *qablītu* tuning, for example, which starts the first chapter, the tritone is found as a diminished fifth between front-string and fifth-string. Since the treatise uses the nine strings known from U.3011, the total range of the pitch set covers more than an octave; therefore the tritonic inversion of this interval, an augmented fourth, is also found between fifth-string and second-back-string. Here it can be clearly seen that there is no terminological distinction between an interval and its inversion: both are *nīš gabarī*. The tablet instructs us to tighten the front-string and the second-back-string, thus widening to a perfect fifth the diminished fifth between front-string and fifth-string, and narrowing to a perfect fourth the augmented fourth between fifth-string and second-back-string. The pitch-set has changed, and *qablītu* tuning passes to *nīš gabarī*. In the case of the new *nīš gabarī* tuning, the interval *nīd qabli* (4-1), which in the previous tuning of *qablītu* had been a perfect fourth (with the perfect fifth between fourth-string and second-back-string, according to the octave-reflection), has now become a tritonic augmented fourth (accompanied by the tritonic diminished fifth). Resolving now this unclear interval leads in turn to *nīd qabli* tuning and a new tritone at the *pītum* interval between third-back-string and Ea-creator (4-7). In this way, the

text leads the musician from one diatonic pitch-set to another, until the tritone has appeared in each of its seven possible positions. These tunings advance in chapter 1 from *qablītu* through to *išartu*, and retreat in chapter 2 from *išartu* back to *qablītu*.³³ Since there can be only one unclear interval in each tuning, and since we know which this is for each, it is possible to determine the exact pitch structure of all seven tunings. The exact identity of each tuning further depends on whether the strings of U.3011 are ranked in ascending or descending order (cf. 6.30).

- 6.28 The question remained, however: what is the relationship between the homonymous tunings and intervals? UET VII 74 col. ii is clearly relevant to this semantic riddle, since the names are used in both senses simultaneously, designating the successive tunings (X and Z) as well as the “unclear” interval (Y), to be adjusted in each modulation. The obvious approach was to examine each scale against its eponymous interval for some shared structural feature. Now, the tritonic interval in a given tuning is also found as the name of the subsequent tuning (in the first chapter; in the second it is reversed). This datum is obviously relevant, since the series of tritonic interval names adheres to the same cycle as the series of the tuning names, though the two are out of phase. At first glance, one might suppose that the unclear interval, once cleared, gives its name to the new tuning thus established. But this rather ungainly explanation, which would be still more tortuous for the retreating second chapter, yields to a more elegant solution.
- 6.29 Kümmel (1970) showed that, in order to establish a given tuning, one might begin the diatonic process from the interval of the same name; when this is done, the last interval tuned, the tritone, is found just where the text says it should be in each quatrain of UET VII 74 col. ii.³⁴ The synchronized cyclicity of interval and tuning names is also explicable in this light: since the tritone is the last interval created in the tuning process, it follows that, when the tritone is resolved, the newly consonant interval acts as the ‘first’ interval within the new diatonic pitch-set, and the newly-created tritone the ‘last’. Thus the apparent cause-and-effect relationship between the clearing of the unclear interval and the homonymous scale which results was specious.
- 6.30 With this discovery, the decryption of the treatise is largely complete. The exact pitchset of each phase of the circle depends on the order in which the strings of

³³ This depends on the extent of restoration, whether through seven or eight phases: cf. 10.35-37.

³⁴ Kümmel (1970) 259ff.

U.3011 are taken, ascending or descending. This question, long a subject of controversy,³⁵ has now been resolved philologically; my diagrams reflect this development.³⁶ One important uncertainty remains, however, namely the extent of restoration. Should the Retuning cycle be complete after the enumeration of seven distinct phases, or should it be carried through to an eighth (that is, a repetition of the first at a semitone difference). Since I take this issue to be central to the question of Greco-Mesopotamian kinship, I leave it until 10.35-37 (but note that my text reflects my belief in seven rather than eight phases).

- 6.31 UET VII 74 col. ii fulfilled the promise of CBS 10996 and VAT 10101, that these tablets belonged to a larger, unified system. It proves Mesopotamian musical mastery, by the Old Babylonian period at the latest, of one way that resonance can be treated. And yet, despite the tuning cycle's attested applicability to practical music, UET VII 74 col. ii is nonetheless a polished theoretical text which maps the permutations of certain acoustical relations and presents them in a coherent system. As such it is as much a scientific treatise as anything else, and documents the Babylonians' command of what I shall call, embracing its musical, scientific and philosophical aspects, the Symphonic Circle.
- 6.32 This cyclicity of the diatonic method may provide another point of contact with the language of ἀρμονία. The wheel must be regarded as one of the most important harmonic devices possessed by the ancients, deeply embedded in the semantic history of ἀρμονία, which was formed from Mycenaean *a-mo*, meaning "a joined thing" and by extension "wheel" (cf. 4.19 and Appendix A). This is not to say that the later Greeks remembered anything definite about Mycenaean vocabulary, merely that the older stratum of meaning may have left its mark on Archaic and Classical usage. It may be ultimately responsible for the prevalence of circular concepts in the harmonic thought of Heraclitus, Parmenides, and Empedocles. Earlier still are the βητάρμονες, the "step-joiners"—perhaps "wheel-dancers"—of Mycenaean antiquity who dance in a circle around Demodocus and Apollo (cf. 4.22, 5.29). Since we find other cyclic phenomena described by derivatives of Proto-Indo-European **ar*—seasonal and age cycles for example,³⁷ or the Vedic depiction of *Rta* as a wheel³⁸—it would not be

³⁵ Vitale (1982) 243f.; Krispijn (1990); West (1994); Gurney (1994); Crocker (1997).

³⁶ Gurney/West (1998), 223f., with contribution from Th. Krispijn.

³⁷ For the seasonal cycle as harmonic, including the 'Chaldean' division of the year by the musical ratios, see for example D. S. 1.16.1-2; Plut. *De anim. procr.* 1028f: Χαλδαῖοι δὲ λέγουσι τὸ ἔαρ ἐν τῷ διὰ τεττάρων γίνεσθαι πρὸς τὸ μετόπωρον κ.τ.λ.;

surprising if the diatonic cycle would be assimilated thereto. This aspect of musical ἀρμονία might add further weight to the argument for παλιντροπος in Heraclitus fr. 51 (cf. 4.14).

- 6.33 This chapter has presented the key musical texts and what has been teased from their internal evidence, with observations of my own. In the absence of new data, the subject has seemingly reached an impasse. But more might be extracted from these documents by comparison with the Greek evidence, if once the two traditions can be bridged. In principle, at least, it is possible, if the proposed syncretism is well-enough understood, to see certain aspects of Greek music as a palimpsest in which traces of the Mesopotamian τέχνη might still be discerned. This is most likely to come through clarifying the musical function of the epicentric conception. This is explored in 10.0.
- 6.34 What is clear at this point is the refinement of the system, both in the highly stylized presentation of the data and in the exhaustive exploitation of consonance according to the method of 'Pythagorean' tuning. The musical tools which result from the system are the seven diatonic scales, within which each interval relationship would have, according to the laws of resonance, a characteristic tonal force which might be deployed musically in a variety of ways; this may be ultimately reflected in the Greek conception of δύναμις (cf. 10.30-33). Further musical potential comes from the modulatory process of "clearing" the tritone, thus providing a means of interconnecting the seven individual musical tools into an integrated tonal kit. How exactly these tools were used in the Near East is entirely unknown at present, since the one complete score that has survived has yet to be convincingly deciphered. It appears from VAT 10101, however, that tunings were not combined within the same piece; the same was true of Greek heptachordal music in its classical, Terpandrian form (cf. 7.60). Despite our general ignorance of Mesopotamian practice, the structure of the diatonic tone system is well-enough established and sufficiently distinctive to allow its vestiges to be traced into the Greek material.

Aristid. Quint. 3.19 (119.10-20); cf. 3.7 (105.5ff.); Macr. *Sat.* 1.19.15; Boeth. *De inst. mus.* 1.2 (187.24-188.25).

38 *R̥gveda* 1.164.11, 9.70.1, 10.123.3. For *R̥tá*, see 4.23.

7.0 The Diatonic Genus

7.1 As we have seen, the diatonic or 'Pythagorean' tuning process—the heart of the Mesopotamian musical system—was also known in Greece. If it is right that the Terpandrian seven-stringed lyre is best understood in relation to an Orientalizing, and specifically Assyrianizing, musical movement, it follows that the diatonic component of Greek music must have had a continuous history from the early Archaic period onwards. This chapter presents the evidence for the history of the diatonic in Greece as it can be reconstructed through extant Greek material. I argue that the fundamental importance of diatony in pre-Aristoxenean theory has been largely overlooked due to the relative lateness of our sources. For we have lost nearly two centuries of written θεωρία from the so-called *Περὶ μουσικῆς* of Lasus in the late sixth century¹ down to the *Elementa Harmonica*, which saw the effacement or transformation of older terms and conventions. All the same, it can be shown that Aristoxenus saw ἀρμονική as an essentially diatonic art, and that the genera which were not strictly diatonic were nevertheless obliged to adhere to certain minimum diatonic principles. Other historical testimonia support the idea that diatony was an important—perhaps the most important—component in the very earliest layers of the Greek evidence. Moreover, it is possible to detect in some of this evidence indications of a circular conception, or details associated with such a conception in later sources. Taken all together, the Classical and Archaic antecedents of the σύστημα τέλειον suggest a point of departure that is entirely compatible with the Symphonic Circle and its seven diatonic phases.

7.2 Other types of tuning were more popular in the late fifth and fourth centuries, namely those classified within the enharmonic and chromatic genera.² But according to Aristoxenus, who devised the system as we know it, the diatonic was older than either:

πρῶτον μὲν οὖν καὶ πρεσβύτατον αὐτῶν θετέον τὸ διάτονον, πρῶτον γὰρ αὐτοῦ ἢ τοῦ ἀνθρώπου φύσις προστυγχάνει, δεύτερον δὲ τὸ χρωματικόν.

¹ Mart. Cap. 9.936; *Suda* s.v. Λάσος; cf. 5.18.

² Without going into detail, the various genera and their shades (χρόαι) were catalogued by the position of pitches which were 'movable' between the 'bounding' tones of the consonant fourth (οἱ περιέχοντες φθόγγοι): see first Aristox. *Harm.* 21-7.

τρίτον δὲ καὶ ἀνώτατον τὸ ἐναρμόνιον, τελευταίῳ γὰρ αὐτῷ καὶ μόλις μετὰ πολλοῦ πόνου συνεθίζεται ἡ αἴσθησις.³

Now, the diatonic must be put down as the first and oldest of them [*sc.* the genera], for the natural state [φύσις] of man comes across it first, and afterwards the chromatic, and third and finally the enharmonic, for it is the last to which the perception grows accustomed—and with difficulty at that, after much labor.

- 7.3 It might be thought that Aristoxenus introduces φύσις here as a way of theorizing about the forgotten origins of the genera, just as Aristotle offers neat but overly simplistic accounts of the origins of tragedy and comedy.⁴ Yet the appeal to nature is somewhat more complicated, for elsewhere Aristoxenus seems to have qualified this position. This emerges from a passage of ps.-Plutarch, which almost reads as a continuation of the one just cited:

δεῖ γὰρ δηλονότι κατὰ τὴν τῆς ἀνθρωπίνης φύσεως ἔντευξιν καὶ χρῆσιν τὸ πρεσβύτερον λέγειν, κατὰ γὰρ αὐτὴν τὴν τῶν γενῶν φύσιν οὐκ ἔστιν ἕτερον ἑτέρου πρεσβύτερον.⁵

For it is clear that we must say 'older' in accord with the discovery and use of by human nature; for according to the nature itself of the genera no one is 'older' than another.

Thus, Aristoxenus did not believe that musical history merely played the design of nature; otherwise he would surely have placed the most 'natural' structure at the pinnacle of the evolution. This is precisely what is done when one sees the diatonic basis of the Perfect System as the ultimate systematization of earlier defective tone structures (cf. 1.12). A persistent tradition does indeed describe the diatonic as more natural than the other genera, and given its systematic dependence on consonant

³ Aristox. *Harm.* 19; the formal sequence is followed, without chronological context, by e.g. *Anth. Pal.* 16.220.5f. (Antipater); Cleonid. 3 (181.12ff.); ps.-Plut. *de Mus.* 1142d; Adrastus ap. Theo Sm. 53.17-56.5; Gaud. 5 (331.8f.); Boeth. *De inst. mus.* 1.15 (200.25f.), 1.21 (212.25). The sequence is reversed by Bacch. 21 (298.6), Vitruv. *de Arch.* 5.4.3, as it is (more or less) in Aristoxenus' presentation of the χρώα (Harm. 21-7).

⁴ Arist. *Po.* 1449a9ff. Cf. Pickard-Cambridge (1962), 89-97, 132ff.

⁵ Ps.-Plut. *de Mus.* 1137e.

intervals, this is a crucial point.⁶ And yet Aristoxenus himself makes the 'natural' diatonic the *oldest* of the genera, at the same time denying that the later types were any less natural than it. This will be important for understanding the diatonic basis of the other genera (7.26-39). Thus, the development of music was not dictated by nature, but resulted from the control of nature through human invention. The question was concisely posed and answered centuries later by Bacchius, who summarized Aristoxenean material:

Πῶς ὑπάρχει [sc. τὰ κατὰ τὰς μελωδίας συμβαίνοντα]; — Ἄ μὲν φύσει, ἅ δὲ τῇ ἡμετέρᾳ χρήσει.⁷

How do [sc. the phenomena of melody] come about? — Some arise from nature, others from our own use.

- 7.4 In his ranking of the genera, then, it seems that Aristoxenus has in mind a clear picture of historical priority. There is good reason to believe that ὁ μουσικός should be taken at his word. Obviously we cannot expect Aristoxenus to have a perfectly accurate picture of the state of Greek music from three centuries earlier. Nevertheless, if the diatonic was in fact of great antiquity, one may at least credit the musicians of the fourth century with a general awareness of the fact.

⁶ This may be inferred from Philolaus' and Plato's preference for the diatonic, but is made explicit by Vitr. *de Arch.* 5.4.3: *diatoni vero, quod naturalis est, facilius est intervallorum distantia* ("indeed, because it is natural, the distance of intervals of the diatonic is easier"); Nicom. *Ench.* 7 (249.1ff.): τὴν δὲ πρόβασιν ἀνάγκη τινὶ φυσικῇ . . . κατὰ τοῦτο τὸ διατονικὸν γένος κ.τ.λ. ("the progression by some physical necessity . . . in the diatonic", etc.); Aristid. *Quint.* 1.9 (16.10ff.): τούτων δὲ φυσικώτερον μὲν ἐστὶ τὸ διάτονον κ.τ.λ. ("Of these, the diatonic is more natural" etc.); Boeth. *De inst. mus.* 1.21 (212.26): *diatonum quidem aliquanto durius et naturalius*. Plato *Lg.* 657a-b calls for music which follows the laws of nature (μέλη τὰ τὴν ὀρθότητα φύσει παρεχόμενα), and this can be loosely connected with the diatonic given his preference for it in the *Republic* and *Timaeus*; cf. Adrastus ap. Theo Sm. 56.3-5: τὸ δὲ διάτονον γένος ἀπλοῦν τι καὶ γενναῖον μᾶλλον κατὰ φύσιν· διὸ μᾶλλον τοῦτο παραλαμβάνει Πλάτων ("The diatonic genus is somewhat simple and more noble by nature; for this reason Plato embraced it the more"); cf. Macr. *Somn. Scip.* 2.4.13 *diatonum mundanae musicae doctrina Platonis adscribitur*.

⁷ Bacch. 2 (292.7f.).

7.5 A number of arguments confirm this view. First, while the diatonic may have shared the Classical stage with the chromatic and enharmonic genera, it must have constituted the foundation of the new σύστημα τέλειον. The τόνοι or ‘pitch keys’—by which Aristoxenus organized and interrelated the various octave species (σχήματα) of each genus and the smaller fragments (συστήματα) thereof for the purposes of modulation and interconnection (μεταβολή)—were essentially diatonic in nature. This follows from the fact that the term τόνος in this usage seems to derive from its more basic meaning, “the difference between a perfect fourth and a perfect fifth” (cf. 2.21). As we saw in the Mesopotamian system, it is through the continuous alternation of these two intervals that the diatonic scale is generated, and consequently a series of τόνοι in the earlier sense of the word. Since these pitches were the same τόνοι “upon which systems are placed and sung”,⁸ we may exclude a direct etymology from τόνος as τάσις (“pitch”). Ptolemy considered this a likely explanation of the ancients’ coinage, though the exact derivation of this layer of meaning had been forgotten by his time.⁹ There were in fact thirteen τόνοι (and later fifteen), rather than seven or eight, in the σύστημα τέλειον.¹⁰ But this came about merely as an extension of the diatonic process through two cycles of alternating fifths and fourths, rather than one, so that all possible modulations could be accommodated by an underlying grid of semitones.

⁸ Cf. Aristox. *Harm.* 37: πέμπτον δ’ ἐστὶ τῶν μερῶν τὸ περὶ τοὺς τόνους ἐφ’ ὧν τιθέμενα τὰ συστήματα μελωδεῖται (“The fifth subtopic [of ἀρμονική] is that which concerns the τόνοι, upon which the systems which are sung are placed”).

⁹ Ptol. *Harm.* 2.10 (62.21f.): τόνῳ διαφέροντας ἀλλήλων ὑποθέμενοι, καὶ διὰ τοῦτο ἴσως τόνους αὐτοὺς ὀνομάσαντες (“assuming these to differ from each other by a τόνος, and perhaps for this reason naming them τόνοι”).

¹⁰ Aristoxenus’ theory of the τόνοι is alluded to by Cleonid. 12 (203.4-204.15); Aristid. Quint. 1.10 (20.5ff.); cf. ps.-Censor. *de Mus.* 6.609.17ff.; Isid. *Etym.* 3.20.7-8; see also the criticisms of Ptol. *Harm.* 2.9-11.

Hence the *τόνος* in this sense derives from the whole-tone's function as a useful unit of sonic measurement.¹¹

- 7.6 That the *σύστημα τέλειον* had a theoretical precursor in the diatonic has been further obscured by a passage of the *Elementa Harmonica* in which Aristoxenus, in criticizing the diagrams of his predecessors, says that they concerned themselves only with octachords in the enharmonic genus.¹² This allusive and punning account was already confusing in antiquity. As Proclus commented, "Aristoxenus is saying something incredible here, that the ancients did not know the diatonic diagram",¹³ reporting also the older gibe of Adrastus, elicited by this same problem, that Aristoxenus was generally "concerned to seem to say something brand new" (ὅπως

¹¹ Aristox. *Rhythm.* 2.21 γνώριμον κατὰ μέγεθος, ἥτοι ὡς τὰ τε σύμφωνα καὶ ὁ τόνος ἢ ὡς τὰ τούτοις σύμμετρα ("... intelligible in magnitude, either like the consonant intervals and the *τόνος*, or like those intervals commensurate with these"). Adrastus ap. Theo Sm. 53.3ff.: καθάπερ ὁ πῆχυς τοῦ κυρίως τοπικοῦ διαστήματος ... ἔστι δὲ γνωριμώτατον τὸ τονιαῖον διάστημα. ἐπειδὴ τῶν πρώτων καὶ γνωριμωτάτων συμφωνιῶν ἔστι διαφορὰ ("just like the cubit for literally spatial intervals ... the *τόνος* is the most intelligible interval, because it is the difference between the first and most intelligible consonances"); cf. 66.19-67.3: οἱ δὲ παλαιοὶ πρῶτον διάστημα τῆς φωνῆς ἔλαβον τὸν τόνον... ὅτι μέχρι τούτου καταβαίνουσα ἡ φωνὴ τοῦ διαστήματος ἀπλανῆ τὴν ἀκοὴν φυλάσσει. τὸ δὲ μετὰ τοῦτο οὐκέτι οἷα τε ἡ ἀκοὴ πρὸς ἀκρίβειαν λαβεῖν τὸ διάστημα ("and the ancients took the tone as the first interval of the voice ... because, as the voice proceeds, it safeguards the hearing as far as this interval, but after this [i.e. with smaller intervals] the hearing is no longer able to take the interval with precision").

¹² Aristox. *Harm.* 2-3: τοὺς μὲν οὖν ἔμπροσθεν ζήμηνους τῆς ἀρμονικῆς πραγματείας συμβέβηκεν ὡς ἀληθῶς, *restituit Marquard ex Procl. in Ti.* ἀρμονικοὺς εἶναι βούλεσθαι μόνον, αὐτῆς γὰρ τῆς ἀρμονίας ἤπτοντο μόνον, τῶν δ' ἄλλων γενῶν οὐδεμίαν πώποτ' ἔννοιαν εἶχον ("Now it happens that those who previously set themselves to the endeavour of ἀρμονική truly wanted to be only 'ἀρμονικοί', for they grasped only the enharmonic [ἀρμονία] itself, but never yet had any thought for the other genera"); cf. the summary, with some additions, in ps.-Plut. *de Mus.* 1143e-f.

¹³ Procl. *in Ti.* 3.192a (2.169.21-29 Diehl): ἐν οἷς καὶ λέγει τι θαυμαστὸν ὁ Ἀριστόξενος, ὅτι τὸ διατονικὸν διάγραμμα οὐκ ᾔδεσαν οἱ παλαιοὶ ... πῶς οὖν ταῦτα λέγει καίτοι καὶ τοῦ Πλάτωνος κατὰ τὸ διατονικὸν γένος ἐκθεμένου τὸ διάγραμμα καὶ τῶν ἀμφὶ τὸν Τίμαιον, θαυμάσαι ἄξιον.

ἀν δόξη τι καινὸν λέγειν πεφροντικῶς).¹⁴ For the diatonic had been the subject of close scrutiny by Philolaus, Plato, and—in his wish to make it conform more closely to the resonant ratios—Archytas.¹⁵ Indeed the statement, according to the usual interpretation, would scarcely accord with Aristoxenus' own chronology of the genera.

7.7 The solution to the riddle must be that Aristoxenus, in focusing on the new system he is forging, neglects an older, established θεωρία as not needing any redress, and saves his criticism for the architects of its change. Aristoxenus brought to completion what had long been sought, a new system which could accommodate the innovations of the late fifth and fourth centuries. What he has taken for granted, then, is the phase of music and its theory preceding these trends, which, relative to the New Musicians, will have been classical forms. Thus, when he complains that

Ἐρατοκλῆς ἐπεχείρησε καθ' ἓν γένος ἐξαριθμῆσαι τὰ σχήματα τοῦ διὰ πασῶν ἀναποδείκτως τῇ περιφορᾷ τῶν διαστημάτων δεικνύς.¹⁶

Eratocles attempted to enumerate the octave-schemes of one genus [*sc.* the enharmonic], showing it, without formal demonstration [ἀναποδείκτως], by the rotation of the intervals.

we should not conclude that the enharmonic genus was the first melodic style ever to be subject to theoretical scrutiny. It was rather the first to be analysed with an eye towards comprehending in a single system the innovative practices that were then (in the second half of the fifth century¹⁷) being developed, what would eventually culminate in the new σύστημα τέλειον. Eratocles is criticized for not having done this well or completely enough, and for doing it ἀναποδείκτως (“without formal demonstration”), that is, without “the logical derivation of propositions from appropriate principles”.¹⁸

¹⁴ Aristox. fr. 8 = Adrastus ap. Procl. *in Ti.* 3.192a (2.169.29ff. Diehl).

¹⁵ Philol. fr. 44B6a D-K (see 8.5); Archyt. fr. 47A16; Pl. *Ti.* 35b-36b. Cf. Burkert (1972), ch. 5 sec. 2; Barker (1978), 3; (1982-9), 2.59f.; West (1992), 165.

¹⁶ Aristox. *Harm.* 6.

¹⁷ Eratocles' dates are unknown, but the resonance between his theory of road-junctions and Ion of Chios fr. 32 (West)—for which see below and cf. West (1992), 226—as well as his use of octachords (see 8.0) lets him be dated approximately to the second half of the fifth century.

¹⁸ Barker (1982-9), 2.130 n. 25.

7.8 The phrase τῇ περιφορᾷ τῶν διαστημάτων is crucial. This “interval rotation” has always been seen as Eratocles’ great achievement, a breakthrough in the cyclical synthesis of disparate tunings. But given the opprobrious tone, it makes more sense to understand the phrase as belonging to the complaint of ἀναποδείκτως. Since Aristoxenus’ criticism of his predecessors was tied to their failure to produce sufficient diagrams, ἡ περιφορά should be a means of demonstrating species without recourse to diagrams, and so presumably could be executed on the instrument itself, with one tuning succeeding another in a visibly and audibly coherent sequence (δεικνύς, “showing”). It was a processual cycle which ‘brought one back around’ to the starting point, exactly as περιφορά suggests. It was thus a familiar technique that could be used without the more rigorous methods required by Aristoxenus—not needing, for example, the linear interval map of the σύστημα τέλειον. The underlying principle of scales linked in a cyclical system would have been the same, but the two forms of presentation are quite distinct. To take full account of the complex musical developments of the late fifth century, a more graph-like approach was needed to assist the ears. This was the function of the musical diagram, as Bacchius explains:

Διάγραμμα δὲ τί ἐστὶ; — Συστήματος ὑπόδειγμα . . . διαγράμματι δὲ χρώμεθα, ἵνα τὰ τῇ ἀκοῇ δύσληπτα πρὸ ὀφθαλμῶν τοῖς μανθάνουσι φαίνεται.¹⁹

And what is a diagram? A representation of a [*sc.* musical] system. And we use a diagram so that, for students of the subject, matters which are hard to grasp with the hearing may appear before their eyes.

7.9 Thus Eratocles did not produce a sufficient account by Aristoxenus’ latter-day standards, but *merely* used a rotational process which did little to transform a no-longer-adequate method of musical analysis. Given that the σύστημα τέλειον reveals a diatonic substructure in the τόνοι, and that Aristoxenus accepted the diatonic as the oldest of the genera, the easiest solution is to suppose that ἡ περιφορὰ τῶν διαστημάτων reveals a thorough familiarity with the cyclical properties of the diatonic method as the basis of pre-Aristoxenean θεωρία—a long-familiar, not novel, approach. It is important, then, that Bacchius defines a diagram as “a flat chart on which *all* the genera could be sung” (σχῆμα ἐπίπεδον, εἰς ὃ πᾶν γένος μελωδεῖται).²⁰

¹⁹ Bacch. 62 (305.16-20).

²⁰ Bacch. 62 (305.16-20). A diagram with all the genera is found at e.g. Nicom. *Ench.* 12 (264.6ff.).

- 7.10 Plato, who was only interested in the diatonic, serves to unite this tuning method with the cyclical in his elaborate Myth of Er, where the eight tones (τόνοι) all partake in a cyclical cosmos.²¹ The old usage of τόνος as “tuning” (cf. 2.25) clarifies the word’s later meaning of “octave species”: that is, these τόνοι were “the tunings”—i.e. the standard tunings—and they were created by cyclical transformation; compare the synonymous term τρόποι, which may thus be rendered as “turnings” of the musical circle.²² The link between these cyclical τόνοι and the diatonic method is established by the intermediate application of τόνος, “tuning”, to mean “diatonic tuning” specifically—an ancient and somewhat untechnical usage, documented from the Classical period (cf. 2.26). Eratocles therefore showed how the enharmonic could be schematized according to a classical, diatonic, and fundamentally circular approach.
- 7.11 In the light of the foregoing, one can see, in a criticism of his predecessors where Aristoxenus’ new, unaddressed harmonic concerns dwarf those of an earlier period, the strata of the evolutionary process which led to the σύστημα τέλειον :

τέταρτον δ' ἂν εἴη μέρος τὰ συστήματα θεωρῆσαι πόσα τ' ἐστὶ καὶ ποῖ' ἄττα καὶ πῶς ἐκ τε τῶν διαστημάτων καὶ φθόγγων συνεστηκότα. οὐδέτερον γὰρ τῶν τρόπων τεθεώρηται τὸ μέρος τοῦτο ὑπὸ τῶν ἐμπροσθεν· οὔτε γὰρ εἰ πάντα τρόπον ἐκ τῶν διαστημάτων συντίθεται τὰ συστήματα καὶ μηδεμία τῶν συνθέσεων παρὰ φύσιν ἐστὶν ἐπισκέψεως τετύχηκεν. οὐθ' αἱ διαφοραὶ πᾶσαι τῶν συστημάτων ὑπ' οὐδενὸς ἐξηριθμῆνται. περὶ μὲν γὰρ ἐμμελοῦς ἢ ἐκμελοῦς ἀπλῶς οὐδένα λόγον πεποίηνται οἱ πρὸ ἡμῶν, τῶν δὲ συστημάτων τὰς διαφορὰς οἱ μὲν ὅλως οὐκ ἐπεχείρουν ἐξαριθμεῖν—ἀλλὰ περὶ αὐτῶν μόνον τῶν ἐπταχόρδων ἃ ἐκάλουν ἁρμονίας τὴν ἐπίσκεψιν ἐποιοῦντο—οἱ δὲ ἐπιχειρήσαντες οὐδένα τρόπον ἐξηριθμοῦντο, καθάπερ οἱ περὶ Πυθαγόραν τὸν Ζακύνθιον καὶ Ἀγήνορα τὸν Μυτιληναῖον.²³

²¹ Pl. *Resp.* 10.616b-617d.

²² For τρόπος as τόνος, see e.g. Plut. *An seni* 793a: τόνων καὶ τρόπων . . . οὓς ἁρμονίας οἱ μουσικοὶ καλοῦσι; *De E Delph.* 389e: εἴτε τόνους ἢ τρόπους εἶθ' ἁρμονίας χρή καλεῖν; cf. West (1992), 188 n.103; ps.-Plut. *de Mus.* 18.1137b: πολυτρόπων; Bacch. 46-7 (303.3ff.), etc.; Gaud. 20 (347.22): τρόπον ἢ τόνον; Aristid. Quint. 1.6 (8.20), 1.10 (20.1-4): τόνον . . . τρόπον συστηματικόν, οἷον λύδιον ἢ φρύγιον, etc.; Alvp. 3 (367.20): τρόπους τε καὶ τόνους.

²³ Aristox. *Harm.* 36-37.

The fourth topic would be to observe the systems: how many they are, what type, and how they are composed from intervals and musical tones. For in neither of these ways has this topic been observed by the earlier harmonists: for the question of whether systems are composed from intervals in every manner, and whether none of these composites run counter to nature, has not met an examination; nor have all the differences of the systems been enumerated by anyone. For concerning what is properly melic and what is not [περὶ μὲν γὰρ ἑμμελοῦς ἢ ἐκμελοῦς], our predecessors have simply made no account. Some made no attempt at all to enumerate the differences between systems, but made examination only of the heptachords themselves, which they used to call ἁρμονίαι. Those who did try were in no way exhaustive, i.e. Pythagoras of Zacynthus and his school, and Agenor of Mytilene and his.

- 7.12 The key phrase here is ἀλλὰ περὶ αὐτῶν μόνον τῶν ἑπταχόρδων ἃ ἐκάλουν ἁρμονίας τὴν ἐπίσκεψιν ἐποιοῦντο. The MSS reading ἑπταχόρδων must be retained against Marquard's proposed emendation of ἑπτὰ ὀκταχόρδων, which has been adopted by all editors since 1868. In M, ἑπτὰ χορδῶν had been corrected to ἑπταχόρδων; wishing to account for this, Marquard saw a parallel in Aristoxenus' criticism, mentioned above, of his predecessors who "only spoke about enharmonic octachord systems" (περὶ συστημάτων ὀκταχόρδων ἑναρμονίων μόνον ἔλεγον).²⁴ It is generally accepted that the *Elementa Harmonica* is, as we have it, a later compilation of two independent drafts; there are a number of parallel topics that are repeated between books 1 and 2.²⁵ Deeming then that the two passages in question were essentially identical critiques, Marquard suggested that ὀκτα- had been omitted in a sort of numerical haplography, whereupon the editor of M closed the gap between ἑπτὰ and χορδῶν in a false emendation.
- 7.13 But this cannot be right. First, ἑπτὰ χορδῶν is more economically explained as an erroneous division of ΕΠΤΑΧΟΡΔΩΝ at the time when word breaks were first introduced to a text without accents, a very natural error for which there is an exact (but inverted) parallel in Nicomachus.²⁶ Second, with ἃ ἐκάλουν ἁρμονίας ("which they used to call ἁρμονίαι"), Aristoxenus is evidently drawing a distinction between an older use of the term ἁρμονία and that of his own day. Now, with the exception of this passage, Aristoxenus always uses ἁρμονία to mean a scale in the enharmonic genus; the enharmonic, so popular in the late fifth and early fourth centuries, had

²⁴ Aristox. *Harm.* 2.

²⁵ Cf. Barker (1982-9), 2.120; West (1992), 4; contrast Bélis (1986).

²⁶ Nicom. *Exc.* 1 (266.7).

become the “tuning” *par excellence*.²⁷ Thus the predecessors here criticized cannot have been talking about the enharmonic. Consequently the first passage cannot be adduced as a parallel, and the supposed haplography vanishes—a lesson not to underestimate the disjunction between the first two books of the *Elementa Harmonica* when attempting to draw “internal” analogies.

7.14 This passage gives us a glimpse of the earlier practical and theoretical norm of the seven-stringed lyre which had been current in the Archaic period and well into the Classical.²⁸ It is clear from the phraseology that Aristoxenus saw these heptachords as a fixed, finite set, as shown both by the definite article and still more so by the intensive pronoun (περὶ αὐτῶν μόνον τῶν ἑπταχόρδων, “only about the heptachords themselves”). This would naturally precede the work of Eratocles and others, whose octachord diagrams were the first steps towards the σύστημα τέλειον. Moreover, these ancient ἀρμονίαι must have been more orderly than the odd tunings, seemingly from the high enharmonic period, preserved by Aristides Quintilianus, which show sometimes more, sometimes fewer than seven pitches.²⁹ For they did in fact have seven pitches—exactly as we should expect from early literary evidence and the consistent representation of seven-stringed lyres throughout the Archaic period.³⁰

7.15 This ancient heptachordy began to undergo a permanent change at the professional level in the first half of the fifth century (probably in c. 480-460),³¹ with a decisive

27 Adrastus ap. Theo Sm. 55.15-56.1: καλεῖσθαι δέ φησιν Ἀριστόξενος τοῦτο τὸ προειρημένον γένος ἀρμονίαν διὰ τὸ εἶναι ἄριστον. ἀπενεγκάμενον τοῦ παντὸς ἡρμοσμένου τὴν προσηγορίαν (“And Aristoxenus says that this, the aforementioned genus, is called ἀρμονία because it is best, taking this title away from τὸ ἡρμοσμένον as a whole”); ps.-Plut. *de Mus.* 1143e-f. See also Henderson (1957), 388f.; West (1992), 164f.

28 Cf. Laloy (1904), 101.

29 Aristid. Quint. 1.9. On these scales generally, see Winnington-Ingram (1936), 55ff.; West (1992), 174f. and n. 47 with literature cited there.

30 Terp. fr. 4.2 (Gostoli); *h. Merc.* 51; Pi. *N.* 5.22: φόρμιγγ’ . . . ἐπτάγλωσσαν; *P.* 2.70f.; Ion of Chios fr. 32 (West), quoted below. For the ceramic evidence, Maas/Snyder (1989).

31 This crucial issue has not been adequately addressed; see first West (1992), 63f. A thorough study of the ceramic evidence is needed; initial indications of my own ongoing survey are that eight-stringed instruments become the most common configuration in professional contexts between 480-460; but note that an accurate typology, could it be established, would itself prove an important dating criterion for the vases. Corroborative literary

turning point being Phrynis' victory at the Panathenaea in 446/5 with his modern πολυχорδία.³² Yet the heptachordal norm must have persisted at the popular level and in the music lesson, for non-professional lyres are still commonly so depicted throughout the period of the New Music and beyond, and the seven strings of the ancients are still clearly recalled in much later sources.³³ Aristotle treats it as a matter of fact that there were seven strings in the old ἁρμονίαι, while the Aristotelian *Problems*, compiled well into the octachord period, nevertheless report heptachords as standard in an earlier θεωρία.³⁴ Nicomachus clings stubbornly to the memory, loyally but wrongly attributing the eighth string to Pythagoras (see 8.8-29). We are thus

evidence is Pliny *N.H.* 7.204, who credits Simonides (traditionally c. 556-468: see West [1971]) with the eighth string—or τὸν τρίτον φθόγγον as the *Suda* puts it (s.v. Σιμωνίδης): see further 8.78—while ps.-Plutarch reports (*de Mus.* 1136c-d) that Lamprocles added a disjunctive tone at the top of the conjunct heptachord (see further 8.32-33). Nicomachus' attribution of the eighth string to Pythagoras in *Ench.* 5 (244.14ff.) was in his time already an old tradition, which may be dismissed as having ulterior motivations (cf. 8.8). The tradition of Terpander's eighth string is equally false: see 8.49-69.

³² Ister *FGrH* 334F56 = schol. a *ad Ar. Nub.* 971: ὁ Φρυνὶς κιθαρωδὸς . . . δοκεῖ πρῶτος κιθαρίσαι παρ' Ἀθηναίοις καὶ νικῆσαι Παναθήναια ἐπὶ Καλλικμάχου ἄρχοντος. For Phrynis, see further 2.38-40, 8.63.

³³ E. *Alc.* 446f.: ἐπτάτονόν τ' ὀρεῖαν / χέλυν; *Ion* 881; Call. *Del.* 253ff.: ἐνθεν ὁ παῖς τοσσάδσε λύρη ἐνεδήσατο χορδὰς / ὕστερον, ὅσσάκι κύκνοι ἐπ' ὠδίνεσσιν ἄεισαν· ὄγδοον οὐκέτ' ἄεισαν ("Hence the child [*sc.* Apollo] later bound that number [*sc.* seven] of strings to the lyre, as often as the swans sang upon his birth; an eight time they did not yet sing"); forged Laconian decree, Boeth. *De inst. mus.* 1.1 (182.7ff.); Verg. *Aen.* 6.646; Thrasyllus wrote a work called Περὶ τοῦ ἐπταχόρδου probably in the early first century A.D. (Porph. *in Harm.* 5 [91.14]; for dates see Barker [1982-9], 2.209f.) and cf. 8.68; *Anth. Pal.* 9.250 (Onestes); Nicom. *Ench.* 3 (242.5): ἐν γε τῇ ἐπταχόρδῳ κατὰ τὸ παλαιόν, cf. 5 (245.4), 7 (249.15), 9 (253.4), 11 (256.5f.): τῇ τοίνυν ἀρχαιοτρόπῳ λύρᾳ, τουτέστι τῇ ἐπταχόρδῳ; *Exc.* 1 (266.3), 6 (277.9-10); Paus. 3.12.10: χορδαῖς ἐπτὰ ταῖς ἀρχαίαις; Lucian *Astr.* 10; ps.-Plut. *de Mus.* 1141c: ἐπταφθόγγου τῆς λύρας ὑπαρχούσης ἕως εἰς Τέρπανδρον; *Exc. Neap.* 23 (418.10ff.); Procl. *Chr. ap. Phot. Bibl.* 320a33-b11; Alex. Aphr. *In Metaph.* 1093a13; Clem. Al. *Strom.* 6.16.144; Isid. *Etym.* 3.22.4; *Suda* s.v. Τέρπανδρος; etc.

³⁴ Arist. *Metaph.* 1093a14: ἐπτὰ δὲ χορδαὶ ἡ ἁρμονία; ps.-Arist. *Pr.* 19.7: οἱ ἀρχαῖοι ἐπταχόρδους ποιοῦντες ἁρμονίας ("the ancients, making their heptachordal ἁρμονίαι"); 19.47; 19.25: ἐπτάχορδοι ἦσαν αἱ ἁρμονίαι τὸ παλαιόν; 19.32: ἐπτὰ ἦσαν αἱ χορδαὶ τὸ ἀρχαῖον; cf. 19.44.

justified in regarding Aristoxenus' τῶν ἑπταχόρδων as comprising a coherent collection of some sort associated with this ancient phase of Greek music, just as the Aristotelian problems cited refer in the plural to heptachordal ἁρμονίαι. For Aristoxenus the term ἁρμονία was closely associated with the tunings of this heptachordal "system", not used as "attunement" in some more generic sense which might include a variety of other tunings with more or fewer than seven strings, such as those in Aristides Quintilianus. For Aristoxenus this set of heptachordal tunings comprised *the* ἁρμονίαι.

- 7.16 Thus two broad groups of ἁρμονικοί may be detected in Aristoxenus' critique. Like Eratocles, the schools of Pythagoras of Zacynthus and Agenor of Mytilene, while aware of the subjects which needed discussion, addressed them inadequately. But the unnamed adherents of seven-stringed classical music never even attempted an investigation. It was not the concern of the earlier codified heptachordy, widely taught in the παιδεία, to incorporate new features which would catalyze a breakdown of rules and conventions which had been handed down from the Archaic period.
- 7.17 This conservative force, and the coexistence in the later fifth century of an old heptachordal discipline with its modification by avant-garde musicians, is well illustrated by Right Logic's resentful account of the contemporary music lesson in *Clouds*—a passage rife with musical puns.³⁵ Scandalously, young students are

³⁵ The general image of the melodic road (see below), raised by κάμψειν τινα καμπήν, οἷας οἱ νῦν, τὰς κατὰ Φρῦνιν ταύτας τὰς δυσκολοκάμπτους, is elaborated throughout. The phrase εἶτα [ἔδει] βαδίζειν ἐν ταῖσιν ὁδοῖς εὐτάκτως refers to the orderly, i.e. traditional, pursuit of melodic pathways—note that τάξις is the technical word for the pitch of a string (cf. 9.31). There may be a similar joke in the βαδίζουση of Pherec. fr. 155.24 K-A (cited below). Even ἐπετρίβετο may have a double meaning, punning on τρίβος ("path"), which would ameliorate the repetitiousness of ἐπετρίβετο τυπτόμενος: if a boy turned aside from the melody, he trod his devious path with a beating from the teacher. τῷ μηρῷ μὴ ξυνέχοντας must have some relevance to the cardinal rule of συνέχεια (discussed below), though it is unclear to me how the joke works.

introducing fashionable modulations—καμπαί or “bends”,³⁶ a term which derives its meaning from the ancient image of the melodic “road”³⁷—into the older style on offer from the κιθαριστής:

εἴτα βαδίζειν ἐν ταῖσιν ὁδοῖς εὐτάκτως εἰς κιθαριστοῦ . . .
 εἴτ' αὖ προμαθεῖν ᾄσμ' ἐδίδασκεν τῷ μηρῷ μὴ ξυνέχοντας . . .
 ἐντειναμένους τὴν ἁρμονίαν ἣν οἱ πατέρες παρέδωκαν.

³⁶ Cf. Ar. *Nub.* 333: ᾄσματοκάμπτας (“song-benders”); fr. 753 K-A: φωνάριον ᾠδικὸν καὶ καμπτικόν; Tim. fr. 26.3 (PMG 802) of Phrynis: ἰωνοκάμπταν; Pherec. fr. 155.15 K-A = ps.-Plut. *de Mus.* 1141d-1142a of Phrynis: κάμπτων με καὶ στρέφων ὅλην διέφθορεν (“he destroyed me [*sc.* Music] utterly with his bending and twisting”); cf. 1142a, a fragment attributed to Aristophanes (953 K-A) but possibly a continuation of the Pherecrates fragment (cf. Barker [1982-9], 1.237 n. 204): ἑξαρμονίους ὑπερβολαίους τε ἄνοσίους / καὶ νιγλάρους. ὥσπερ τε τὰς ῥαφάνους ὅλην / καμπῶν (v.l. κάμπτων) με κατεμέστωσε (“out-of-the-ἁρμονία, high-pitch, unwholesome / and whistling; and he [*sc.* Philoxenus or Timotheus] stuffed me full of bends like a cabbage”); Eur. fr. 366 K-A: ἡ μουσικὴ πρᾶγμ' ἐστὶ βαθὺ καὶ καμπύλον (“Music is a deep and devious business”); Poll. *Onom.* 4.66: Φρῦνιν . . . μέλεσι πολυκαμπέσι . . . κεχρησθαι λέγουσιν.

³⁷ Cf. Hom. *Od.* 8.73f.; 8.481; 22.347; *h. Merc.* 451: οἶμος ἀοιδῆς; Pi. *O.* 1.110: ὁδὸν λόγων; Pi. *O.* 9.47: ἐπέων . . . οἶμον λιγύν; cf. Pi. *N.* 6.45, 54: ὁδὸν ἀμαξιτὸν εὖρον; Pi. *P.* 4.247f.; 9.45; Pi. *I.* 4.1: κέλευθος; cf. B. 5.31; Pi. *N.* 7.51; fr. 6.118 (S-M); Ion of Chios fr. 32 (West), cited below; Ar. *Av.* 1374, cited below; Aristox. *Harm.* 5 and 67 (see below); cf. 69 *et passim*; Call. *Jov.* 78: Φοῖβου δὲ λύρης εὖ εἰδότας οἶμους; cf. *Del.* 9; A. R. 4.150; *Anacreont.* 34.14 (West); Adrastus ap. Theo Sm. 54.12-15; Nicom. *Ench.* 6 (245.21), 12 (261.20); Gaud. 6 (333.28) *et passim*; Anon. Bell. 3.78 (25.8). The increasingly complex rules for choosing one's route accounts for the curious descriptions of modern melodies as “devious ant-paths”: Ar. *Thesm.* 99f. of Agathon: (Euripides speaking) Σίγα· μελωδεῖν γὰρ παρασκευάζεται. / (Mnesilochus responds) μύρμηκος ἀτραπούς, ἥ τί διαμινυρίζεται; Pherec. fr. 155.22-5 K-A = ps.-Plut. *De mus.* 1141d-1142a of Timotheus: ἅπαντας οὖς λέγω / παρελήλυθεν, ἄγων ἐκτραπέλους μυρμηκίας. / κἄν ἐντύχη πού μοι βαδίζουση μόνη. / ἀπέδυσε κἀνέλυσε χορδαῖς δώδεκα; cf. Psell. *De trag.* 5: ἀνάτρητος (“bored through and through”) of the new music, with Winnington-Ingram's comments ap. Browning (1963), 77. The road image survives into modern Greek, where δρόμος designates “mode” (Beaton [1980], 9). It is also found in ancient Indian music theory, where *antaramarga* is “the path between the notes”: see e.g. Widdess (1995), 264-7.

εἰ δέ τις αὐτῶν βωμολοχεύσαιτ' ἢ κάμψειέν τινα καμπήν
οἷας οἱ νῦν, τὰς κατὰ Φρῦνιν ταύτας τὰς δυσκολοκάμπτους,
ἐπετρίβετο τυπτόμενος πολλὰς ὥς τὰς Μούσας ἀφανίζων.³⁸

And then [*sc.* they had] to walk in good order in the streets to the citharist's . . .

And then in turn he taught them to learn a song by heart, not holding their thighs together .

. . .

Tuning the ἀρμονία which our fathers handed down.

But if one of them played the fool or effected some modulation—

Like musicians nowadays do, those difficultly-bent modulations à la Phrynis—

He got a good long thrashing for doing away with the Muses.

- 7.18 Note first that here in the music lesson, where we must assume a seven-stringed lyre, the term for the tuning is again ἀρμονία, as in the Aristoxenus passage. The conservative musical taste underlying this passage—perhaps not entirely shared by Aristophanes, who indulged in New Music himself (if ironically)—is found again in *Frogs*. When Dionysus brings Aeschylus back to earth as the greatest tragedian, it is the return of an old celebrity who learned his craft in the classical seven-stringed phase of music. As another Aristophanic character complained elsewhere, “they sang everything all alike—on seven strings” (ἦδον ἐπτάχορδα πάνθ' ὁμοῖα).³⁹ Thus, in *Frogs*, Euripides charges Aeschylus with “always composing the same things” (ποιοῦντα ταῦτ' αἰεί),⁴⁰ while Psellus attributes to Euripides the introduction of πολυχорδία to tragedy.⁴¹ The well-known vase-painting by Duris, showing the music lesson in its classical form with boys studying the lyre and epic poetry at the house of the κιθαριστής—and no fewer than four carefully rendered seven-stringed instruments—is from this same Aeschylean period.⁴² One boy is shown with a tablet on which he has written down a hexameter invoking the Muse; it belongs to the traditional prelude style attributed to Terpander—the Aeolic form Μοῖσα is not accidental.⁴³

38 Ar. *Nub.* 964-972.

39 Ar. fr. 467 K-A.

40 Ar. *Ran.* 1250.

41 Psell. *De trag.* 5: συστήμασι δὲ οἱ μὲν παλαιοὶ μικροῖς ἐχρῶντο. Εὐριπίδης πρῶτος πολυχорδία ἐχρήσατο.

42 Berlin F 2285. See West (1992), plate 11.

43 See West (1971), 308.

- 7.19 This “ἁρμονία which our fathers handed down” does not suggest the usual picture of chaotic evolution used to explain the apparently aberrant evidence of Philolaus fr. 6a, the Libation Style of Olympus, and the ἁρμονίαι of Aristides Quintilianus (cf. 1.4, 1.12, 1.25). On the contrary, since ἁρμονία and ἑπτάχορδα in the Aristophanic passages clearly do not refer to one tuning only, it indicates a well-defined convention of tuning which had been stable for generations.⁴⁴ This is confirmed by another music lesson scene where Aristophanes recounts how the boorish Cleon made little progress in his music lessons because he would only learn the Dorian ἁρμονία;⁴⁵ the implication is that mastery of the Dorian led on to a more involved knowledge of tuning. Hence these passages, taken together, refer to a tradition of tuning which was formal, ancient, had several stages of which the Dorian had had some primacy for generations before Aristophanes, *and was properly heptachordal*.
- 7.20 What role did diatony play in this period of the classical—i.e. Archaic—heptachord? Was the diatonic, as in the later fifth century, largely overshadowed by what would become known as the enharmonic and chromatic genera, or by some other tunings of which we have no notice, like those of Aristides (though these themselves are predominantly enharmonic in character)? Or was the Terpandrean heptachord proper to a classical form of diatonic music which endured throughout the Archaic period? A scholiast, commenting on the “ἁρμονία which our fathers handed down”, asserts that “the ancient tuning was σύντονος”⁴⁶—the very term used by Aristoxenus to describe the diatonic in its normal form.⁴⁷ In the music lesson, the diatonic was surely the first tuning method to be learned, since, as Aristoxenus says, it was oldest and first found by human nature. It was, besides, the easiest to learn, since the ear could readily trust the consonant intervals, and the diatonic was tuned by a very regular progression of

⁴⁴ Cf. Hp. *Vict.* 1.18: ἁρμονίης συντάξεις (“the arrangements of ἁρμονία”).

⁴⁵ Ar. *Eq.* 985-96.

⁴⁶ Schol. *ad* Ar. *Eq.* 968, glossing ἐντειναμένους τὴν ἁρμονίαν: ὡς συντόνου οὔσης τῆς παλαιᾶς ἁρμονίας.

⁴⁷ Cf. Psell. *De trag.* 12 προσηύλουν αὐταῖς οἱ κράτιστοι αὐληταί, ὁ μὲν τὴν χρωματικὴν περίοδον, ὁ δὲ τὴν ἑναρμόνιον, ὁ δὲ τὴν σύντονον; Winnington-Ingram, *ap.* Browning (1963), 71, wished to supplement this as σύντονον <διάτονον>, but the text should stand because σύντονον would have been more likely to drop out than διάτονον.

these πρώται συμφωνίαι.⁴⁸ The enharmonic, by contrast, cannot be established solely through ἡ λῆψις διὰ συμφωνίας.⁴⁹ Requiring years of practice, it belonged to the art of the professional citharode.⁵⁰ It is unlikely, then, that the citizen-choruses of tragedy would have been called upon to make quarter-tone discriminations. As Aristides Quintilianus wrote:

φυσικώτερον μὲν ἐστὶ τὸ διάτονον (πᾶσι γὰρ καὶ τοῖς ἀπαιδευτοῖς παντάπασι μελωδητόν ἐστι) . . . ἀκριβέστερον δὲ τὸ ἐναρμόνιον· παρὰ γὰρ τοῖς ἐπιφανεστάτοις ἐν μουσικῇ τετύχηκε παραδοχῆς, τοῖς δὲ πολλοῖς ἐστὶν ἀδύνατον.⁵¹

The diatonic is more natural, for it can be sung by everyone, even those who are altogether uneducated . . . But the enharmonic is more exacting; for it has won acceptance from the most illustrious men in music, and is impossible for most people.

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- 48 Cf. Aristox. *Harm.* 55: πολὺ μᾶλλον τοῖς τῶν συμφώνων μεγέθεσι πιστεύει ἡ αἴσθησις ἢ τοῖς τῶν διαφώνων· ἀκριβεστάτη δ' ἂν εἴη διαφώνου διαστήματος λῆψις ἢ διὰ συμφωνίας ("our perception is much more trusting of the consonant interval sizes than the non-consonant, and the tuning of a nonconsonant interval would be most precise when it is arrived at through consonance"). Cf. Vit. *de Arch.* 5.4.3, cited above; Adrastus (ap. Theo Sm. 53.3ff), cited above.
- 49 Ps.-Plut. *de Mus.* 1145b-c, esp. τὸ μὴ δύνασθαι ληφθῆναι διὰ συμφωνίας τὸ μέγεθος, καθάπερ τό τε ἡμιτόνιον καὶ τὸν τόνον καὶ τὰ λοιπὰ δὲ τῶν τοιούτων διαστημάτων ("the magnitude [*sc.* of a quarter-tone] cannot be taken through consonance, like the semitone and tone and the other such intervals").
- 50 Aristox. *Harm.* 19: τρίτον δὲ καὶ ἀνώτατον τὸ ἐναρμόνιον, τελευταίῳ γὰρ αὐτῷ καὶ μόλις μετὰ πολλοῦ πόνου συνεθίζεται ἡ αἴσθησις ("Third and last comes the enharmonic, for the perception becomes accustomed to it last and with difficulty after much labor"); cf. Adrastus ap. Theo Sm. 56.1ff.: ἐστὶ δὲ δυσμελωδητότατον καὶ, ὥς ἐκεῖνός φησι, φιλότεχνον καὶ πολλῆς δεόμενον συνηθείας, ὅθεν οὐδ' εἰς χρῆσιν ῥαδίως ἔρχεται ("it is very difficult to sing and, as he [*sc.* Aristoxenus] says, artistic and requiring much habituation, whence it does not come easily into use"). Consider Plato's portrait of musicologists straining to distinguish between such closely-packed intervals (*Resp.* 7.531a-c); as Barker (1978), 8, points out, πυκνώματ' ἅττα ὀνομάζοντες provides a verbal link to the καταπύκνωσις mentioned by Aristoxenus (*Harm.* 7, 28, 38, 53), which relied on quarter-tone discriminations and seems to have acted as musical graph paper for measuring very fine intonational shades.
- 51 Aristid. Quint. 1.9 (16.11-15); cf. Vit. *de Arch.* 5.4.3.

- 7.21 It is true that the enharmonic was considered proper to tragedy in the Classical period.⁵² Its original defining feature, however, was not the difficult quarter-tone πυκνόν, but the consonance-derived ditone, which the choruses would in fact have been able to sing. As Aristoxenus believed, this basic form of the enharmonic had been drawn by Olympus centuries earlier—in the Orientalizing period in fact—from the diatonic.⁵³ There is no problem, then, in allowing the enharmonic its attested place in tragedy, while at the same time conceding that the further refinement of the quarter-tone discriminations was less essential to its popular character than the underlying—and readily singable—diatonic substrate. In fact, this three-pitched version of the enharmonic is attested in the *Paeon* of Athenaeus, one of the Delphic hymn inscriptions of the Hellenistic period,⁵⁴ which shows the enduring and popular appeal of this style over the centuries since its invention. Thrasyllus too treats this as the essential form of the enharmonic.⁵⁵
- 7.22 It is no accident, then, that Aristoxenus lists the diatonic before the enharmonic and chromatic genera. It formed the core of an earlier system, before the modulating and chromatic New Music, before the challenging enharmonic in its heyday. This must be what lies behind his distinction of two ancient phases in Greek musical history:

ὅτι δ' ἔστι τις μελοποιία διτόνου λιχανοῦ δεομένη καὶ οὐχ ἡ φαυλοτάτη γε ἀλλὰ σχεδὸν ἡ καλλίστη, τοῖς μὲν πολλοῖς τῶν νῦν ἀπτομένων μουσικῆς οὐ πάνυ εὐδηλὸν ἔστι, γένοιτο μεντὰν ἐπαχθεῖσιν αὐτοῖς· τοῖς δὲ συνειθισμένοις τῶν ἀρχαϊκῶν τρόπων τοῖς τε πρώτοις καὶ τοῖς δευτέροις ἱκανῶς δῆλόν ἐστι τὸ λεγόμενον . . . μάλιστα μὲν γὰρ καὶ πλεῖστον χρόνον ἐν τῷ χρώματι διατρίβουσιν, ὅταν δ' ἀφίκωνται ποτε εἰς τὴν ἀρμονίαν, ἐγγὺς τοῦ χρώματος προσάγουσι συνεπισπώμενου τοῦ μέλους.⁵⁶

But, that there is a certain style of melic composition [μελοποιία] which needs a ditonic λιχανός, and that it is not the worst μελοποιία but quite the best, is entirely unclear to the many who undertake music these days, but would be if they applied themselves. But what I am saying is clear to those who are accustomed to the first and second ancient styles

⁵² *PHib.* 13.20f., cited below; cf. West (1992), 164.

⁵³ Aristox. fr. 83 = ps.-Plut. *de Mus.* 1134f-1135b: ἀναστρεφόμενον τὸν Ὀλυμπον ἐν τῷ διατόνῳ κ.τ.λ. ("Olympus was roaming about in the diatonic," etc.).

⁵⁴ For this hymn, see now Hagel (2000), 38-89; cf. West (1992), 288ff.

⁵⁵ Thrasyllus ap. Theo Sm. 92.27-93.2.

⁵⁶ Aristox. *Harm.* 23.

. . . For they [sc. musicians today] spend most of their time in the chromatic, and if at some point they end up in the enharmonic, they lead it near to the chromatic, the melody being drawn along.

- 7.23 Of the two archaic styles, one is associated with the enharmonic genus, thought to be the most lofty and beautiful by those who were familiar with both and with contemporary practice. What distinguished the other ancient style? Certainly not chromaticism *merely*,⁵⁷ since this was practiced by those who were unfamiliar with and intolerant of the older styles—effeminate louts who would vomit bile when they heard enharmonic music, as Aristoxenus memorably put it.⁵⁸ Although he does equate one of the earlier styles with the enharmonic, it might seem facile for us to associate a different genus to each phase of music. It is logical to assume, however, that the diatonic played some role since it is not otherwise assigned by Aristoxenus. In fact, it is said that the chromatic was first introduced into tragedy by progressive musicians of the later fifth century like Euripides and Agathon, earlier composers using either the enharmonic on its own—or *combining it with the diatonic*.⁵⁹
- 7.24 It appears then that the diatonic occurred in one or both of the two earlier styles, and this is hardly surprising given Aristoxenus' assertion of the diatonic's historical priority. It is only to be expected that a more difficult and refined style like the quarter-tone enharmonic should be a secondary development. Quite possibly the first style also saw the enharmonic in its more archaic form without the quarter-tone divisions, as established centuries earlier.⁶⁰ Yet this, too, leads us back to the diatonic, which Aristoxenus believed to be older still, and the point of departure for the enharmonic. So either the first ancient style was largely diatonic; or, if it was mixed

57 That is, chromaticism as currently practiced. For evidence of early chromaticism, see below.

58 Aristox. fr. 85 = Plut. *Quaest. conviv.* 711c: οἱ δ' ἄνδρες καὶ διατεθρυμμένοι τὰ ὦτα δι' ἀμουσίαν καὶ ἀπειροκαλίαν, οὓς φησιν Ἀριστόξενος χολὴν ἐμὲν ὅταν ἐναρμονίου ἀκούσωσιν.

59 Plut. *Quaest. conviv.* 645e: Ἀγάθωνος, ὃν πρῶτον εἰς τραγῳδίαν φασὶν ἐμβαλεῖν καὶ ὑπομῖξαι τὸ χρωματικόν; Psell. *De trag.* 5: ἡ δὲ παλαιὰ τραγικὴ μελοποιία γένει μὲν τῷ ἐναρμονίῳ ἐχρήσατο ἀμιγεῖ καὶ μικτῷ γένει τῆς ἀρμονίας καὶ διατόνων, χρώματι δὲ οὐδεὶς φαίνεται κεχρημένος τῶν τραγικῶν ἄχρις Εὐριπίδου; cf. West (1992), 351.

60 As Professor West suggests (correspondence); cf. West (1992), 351f.

with the enharmonic—for Aristoxenus recognizes music of mixed genera⁶¹—we may suppose an anterior phase of diatonic music, according to the Aristoxenean view of musical development.

- 7.25 How then were diatonic tunings approached, practically and theoretically, in this earlier period? Were “the heptachords which they used to call the ἀρμονίαι” in fact the species of an integrated diatonic cycle as in Mesopotamia? It is certainly tempting to infer this from the cyclical interval procession known to Eratocles. Indeed, with a modification of Marquard’s theory of numerical haplography, one could suppose that *περὶ αὐτῶν μόνον τῶν ἑπταχόρδων* once read *περὶ αὐτῶν μόνον τῶν ἑπτὰ ἑπταχόρδων*. Yet, although this is as plausible as Marquard’s conjecture, it is hardly necessary, since the complete *περιφορά* of a heptachord *must* yield seven permutations, no more and no less.⁶² This makes it especially important that a sevenfold division of the ‘citharodic νόμος’ was attributed to Terpander himself (see further 10.38). Ptolemy’s insistence on seven *τόνοι* (cf. 10.37) thus shows him a more faithful heir to the ancient heptachordal music than modernists like Phrynis and Timotheus, or their successors who used the pitch-keys of Aristoxenus.
- 7.26 In fact, it can be shown that, for all their microtonal variation, the Greek genera were required to conform to a basically diatonic structure. This emerges most clearly from two points in combination. First are the names of the principle consonances—the resonant fourth and fifth—called respectively *ἡ [συμφωνία] διὰ τεττάρων*, “the [consonance] through four [*sc.* strings]”, and *ἡ [συμφωνία] διὰ πέντε*, “the [consonance] through five [*sc.* strings]”. Clearly these intervals—which derive from

⁶¹ Aristox. *Harm.* 7: *μιγνυμένων πάλιν τῶν γενῶν*; 44: *πᾶν μέλος ἔσται ἢ τοι διάτονον, ἢ χρωματικόν ἢ ἐναρμόνιον ἢ μικτόν ἐκ τούτων ἢ κοινόν τούτων* (“every μέλος will either be diatonic or chromatic or enharmonic or mixed from these or the common-ground of these”).

⁶² Cf. the *v.l.* at Arist. *Metaph.* 1093a14 (*ἑπτὰ δὲ χορδαὶ ἢ ἀρμονίαι* rather than *ἑπτὰ δὲ χορδαὶ ἡ ἀρμονία*), with the comment of Alex. Aphr. *In Metaph.* 1093a13: *ἑπτὰ δὲ φθόγγοι τῆς διὰ πασῶν καὶ ἀρμονίαι τοσαῦται* (“Seven are the pitches of the octave, and the *harmoniai* are the same in number”), which shows that, if the variant is not in fact the correct reading, the mistake was made already in antiquity, and was besides readily intelligible in its own right. Similarly, in one manuscript of Porph. *in Harm.* 5 (96.16), the title of Thrasyllus’ work is given as *Περὶ ἑπταχόρδων*, as against *Περὶ ἑπταχόρδου* at 91.14—which itself rests upon an emendation: see further Düring’s apparatus *ad* 91.13.

the heptachordal period (cf. 8.45-47)—were so named because they typically occurred across four or five strings respectively. Second is Aristoxenus' cardinal rule of συνέχεια—generally translated as “continuity”—which dictated the minimum conditions for the proper construction of all the genera. This entailed the ‘consonant responsion’, to its counterpart a perfect fourth or fifth away, of every note, *regardless of its microtonal shading*. Only when this condition was met could a scale or tuning (μέλος) be considered “joined/tuned” (ἡρμωσμένον). The precept is clearly presented in two passages of the *Elementa Harmonica*:

ὑποκείσθω δὲ καὶ τῶν ἐξῆς κειμένων φθόγγων κατὰ μέλος ἐν ἐκάστῳ γένει ἦτοι τοὺς τετάρτους διὰ τεττάρων συμφωνεῖν ἢ τοὺς πέμπτους διὰ πέντε ἢ ἀμφοτέρως.⁶³

And let it also be laid down that, for notes which are “continuous” along the μέλος in each genus, either every fourth note is consonant at a fourth, or every fifth note is consonant at a fifth, or both.

οὐ δεῖ δ' ἀγνοεῖν, ὅτι οὐκ ἔστιν αὐταρκες τὸ εἰρημένον πρὸς τὸ ἐμμελῶς συγκεῖσθαι τὰ συστήματα ἐκ τῶν διαστημάτων· οὐδὲν γὰρ κωλύει συμφωνούντων τῶν φθόγγων κατὰ τοὺς εἰρημένους ἀριθμοὺς ἐκμελῶς τὰ συστήματα συνιστάναι, ἀλλὰ τούτου μὴ ὑπαρχόντος οὐδὲν ἔτι γίνεται τῶν λοιπῶν ὄφελος. θετέον οὖν τοῦτο πρῶτον εἰς ἀρχῆς τάξιν οὐ μὴ ὑπαρχόντος ἀναιρεῖται τὸ ἡρμωσμένον.⁶⁴

It is essential to realise that the aforementioned [principle] does not guarantee that systems will be properly assembled from intervals. For nothing stops a tuning from being put together improperly even when the notes are consonant according to the aforementioned numbers [i.e. every note being consonant by a fourth or fifth (or both) with every fourth or fifth note from itself]; but if this condition is not fulfilled, there is no use bothering about the rest: and so this must be made the first principle (θετέον οὖν τοῦτο πρῶτον εἰς ἀρχῆς τάξιν), without the fulfillment of which, attunement (τὸ ἡρμωσμένον) is destroyed.

7.27 With these conditions met, the names of the consonances are fairly accurate. Either every four strings will comprise a consonant fourth, or every five a fifth, but not

⁶³ Aristox. *Harm.* 29.

⁶⁴ Aristox. *Harm.* 54.

necessarily both. This either/or approach to is able to account for the various enharmonic and chromatic scales, which, while the “movable” strings of each tetrachord can be any number of pitches, depending upon genus and shade, still fulfill συνέχεια by virtue of the fact that the tetrachord as a whole responds to another tetrachord either by conjunction *or* disjunction, but not necessarily both.

- 7.28 Only with the diatonic genus do the interval names make consistent sense. With one exception (see below), every fourth and every fifth is consonant and the tetrachords both conjunct and disjunct simultaneously. This results immutably from the consistent alternation of fifths and fourths. The harmonious semantic agreement of the Greek interval names and the diatonic method shows that this genus was the standard by which the others were judged. These genera, which did not match all the structural characteristics of the diatonic, were nevertheless *required* to match some of them. That συνέχεια was an essentially diatonic precept finds confirmation in Ptolemy’s qualification of the structure as διατονικοῦ συνεχοῦς, “continuous diatonic”; this is shortly followed by an example of modulation between a structure consonant at the fifth to one which is consonant at the fourth—a sort of bifurcation of the “continuous diatonic” into its two less continuous offspring.⁶⁵ More obliquely, Plutarch describes the Sirens of Plato’s diatonic scale as “holding together (συνέχουσι) and safeguarding the harmony”.⁶⁶
- 7.29 Finally, to the usual division of intervals into σύμφωνος and διάφωνος, Thrasyllus introduces a distinction which is nowhere else attested. Intervals like the διέσεις, those microtonal divisions of the chromatic and enharmonic genera which cannot be established through ἡ λήψις διὰ συμφωνίας, could still be considered “consonant in

⁶⁵ Ptol. *Harm.* 2.6 (55.12-15): οἷον ὅταν ἀπὸ διατονικοῦ συνεχοῦς ἀποκλίνη πρὸς τὸ γένος ἐπὶ χρωματικόν. ἢ ὅταν ἀπὸ μέλους ἐπὶ τοὺς διὰ πέντε συμφώνους εἰωθότος ποιεῖσθαι τὰς μεταβάσεις ἐπὶ τοὺς διὰ τεσσάρων γένηται τις ἐκτροπή (“As for instance when [*sc.* the μέλος] turns aside the genus a bit from continuous diatonic to the chromatic, or when there is some diversion from a μέλος accustomed to make the steps of its course upon [*sc.* notes] which are consonant at a fifth to those [*sc.* which are consonant] at a fourth”).

⁶⁶ Plut. *Quaest. Conv.* 746a: αἱ μὲν οὖν ὀκτὼ περιόδοις ἐφεστῶσαι τὴν τῶν πλανωμένων ἀστρῶν πρὸς τὰ ἀπλανῆ καὶ πρὸς ἄλληλα συνέχουσι καὶ διασώζουσιν ἁρμονίαν (“the eight [*sc.* sirens], standing over the rotations ‘hold together’ and preserve the ἁρμονία of the movable towards the immovable stars ones and towards each other”).

accord with συνέχεια” (σύμφωνα δὲ κατὰ συνέχειαν).⁶⁷ In other words, the rule which governed the properly heptatonic μέλος ἡρμωσμένον was concerned that all φθόγγοι should occur within a minimum consonant framework—with the framework of the diatonic the most completely consonant. On the other hand, Thrasyllus’ pairing of δίεσις with τόνος encourages us to read the former as “semitonal interval”, the Pythagorean usage of Philolaus fr. 6a (cf. 8.5, 8.36). This is perhaps the easiest way to interpret his description of these intervals as “the first principle of consonance, but not actually consonance” (ἀρχὴ μὲν συμφωνίας, οὐπω δὲ συμφωνία). If this is right, then Thrasyllus has only the diatonic in mind here, not the other genera, and this too would reveal its close connection to συνέχεια.

- 7.30 For his part, as we have seen, Aristoxenus made συνέχεια the “first principle” (ἀρχή) of ἀρμονική.⁶⁸ Thus τὸ ἡρμωσμένον, which is generally translated merely as “attunement”, may be more exactly defined as “attunement according to συνέχεια”, while συνέχεια is better translated as “cohesion”—i.e. “diatonic cohesion”. Since this principle of attunement is said to be “of an elemental character”

⁶⁷ Thrasyllus ap. Theo Sm. 48.16-49.5, esp. 48.20f.: σύμφωνα δὲ κατὰ συνέχειαν οἶον τόνος, δίεσις (“consonant by συνέχεια, like the tone and quarter tone”).

⁶⁸ Cf. Aristox. *Harm.* 19: πολλὰς ἔχοντος διαφορὰς τοῦ ἡρμωσμένου κατὰ τὴν τῶν διαστημάτων σύνθεσιν, ἔστι τι τοιοῦτον ὃ κατὰ παντὸς ἡρμωσμένου ῥηθήσεται ἔν τε καὶ ταύτῳ. τοιαύτην ἔχον δύναμιν οἷαν αὐτὴν ἀναιρουμένην ἀναιρεῖν τὸ ἡρμωσμένον (“although attunement [τὸ ἡρμωσμένον] has many differences with respect to the composition of intervals, for attunement as a whole there is a certain something which will be stated, a single unitary principle having such a force that if it is removed, attunement is also removed”); ps.-Plut. de Mus. 1144b: πρῶτον οὖν περὶ συνεχείας γνωστέον· ἀναγκαῖον γάρ ἐστιν ὑπάρχειν τῇ κριτικῇ δυνάμει συνέχειαν (“So first one must know about συνέχεια; for it is necessary for our critical faculty that συνέχεια be present”).

(στοιχειωδεστάτην),⁶⁹ it is allied with the title of Aristoxenus' work itself—ΑΡΜΟΝΙΚΑ ΣΤΟΙΧΕΙΑ. That Aristoxenus understood ἁρμονική as a whole to be an art stemming from and based upon τὸ ἡρμωσμένον, as he conceived it, is in fact stated explicitly by later sources which depend upon the Aristoxenean tradition.⁷⁰ For all the complexity that could be created through the mixing of genera and modulation between τόνοι, nevertheless heptatonic structures, with their prescribed use of consonance, provided the raw material—the harmonic elements—from which the modern tunings of the late fifth and fourth centuries were built, and into which they should, according to Aristoxenus, be dissolvable.

- 7.31 When combined with the Aristoxenan chronology, συνέχεια opens the possibility that the enharmonic and chromatic were not merely analyzed against a diatonic norm, but represent its historical *modification*. Easy and reliable to tune, the 'clear' consonant intervals of the diatonic could serve as a point of departure for the quarter-tone dissections and whole-tone omissions of the enharmonic, and for the 'coloring' of the chromatic—much like the 'blue' notes of the African-American syncretism, or the octatonic structures of diatonicized Slavonic folk music.

⁶⁹ Cf. Alyp. 1 (367.1-4): τῆς μουσικῆς ἐκ τριῶν . . . ἁρμονικῆς ῥυθμικῆς μετρικῆς, πρώτην τε τάξει καὶ στοιχειωδεστάτην νοητέον τὴν περὶ τὸ ἡρμωσμένον πραγματεῖαν ("Music [*sc.* being comprised] of three subjects, harmonics, rhythmics and metrics, one must consider the activity which concerns τὸ ἡρμωσμένον to be first in order, and of an elemental nature"); Anon. Bell. 3.29 (9.10f.): πρώτην τε τῇ τάξει καὶ στοιχειωδεστάτην νοητέον τὴν περὶ τὸ ἡρμωσμένον πραγματεῖαν. αὕτη δὲ ἁρμονική καλεῖται ("One must consider the practice which concerns τὸ ἡρμωσμένον to be first in position and of an elemental character. And this practice is called ἁρμονική"). Compare to these the close linguistic parallels at Aristox. *Harm.* 1: τὴν ἁρμονικὴν καλουμένην . . . πραγματεῖαν, τῇ τε τάξει πρώτην οὖσαν ἔχουσάν τε δύναμιν στοιχειώδη ("The practice called ἁρμονική, being both first in order and having an elemental significance").

⁷⁰ Schol. *ad* Ptol. *Harm.* 1.1 (3.1): ἁρμονική ἐστὶν ἐπιστήμη θεωρητικὴ τῆς τοῦ ἡρμωσμένου φύσεως ἢ ἕξις θεωρητικὴ τοῦ διαστηματικοῦ μέλους καὶ τῶν τούτῳ συμβαινόντων ("ἁρμονική is the science which regards the nature of τὸ ἡρμωσμένον, or the domain which regards the intervallic μέλος and those things which go along with it."); the first part of this is repeated verbatim at *Exc. Neap.* 7 (413.4f.); cf. Alyp. 1 (1-4), cited above; Anon. Bell. 3.29 (9.10f.), cited above.

7.32 In fact, a persistent tradition treats both the enharmonic and chromatic as derived from the diatonic, in contrast to the Aristoxenean classification into three independent genera. This orientation surfaces in one of the anonymous musical treatises unearthed by Bellerman, which contain, besides a bulk of conventional material, a few real treasures to survive the onslaught of Aristoxenus' followers:

χρῶμα δὲ ἦτοι παρὰ τὸ τετράφθαι πῶς ἐκ τοῦ διατονικοῦ ἢ παρὰ τὸ χρώζειν μὲν αὐτὸ τὰ ἄλλα συστήματα.⁷¹

And the chromatic [*sc.* is so-called] either through having been converted somehow from the diatonic, or from its coloring of other systems.

7.33 In this and other details, the anonymous treatise closely echoes the curious passage which has been interpolated into Aristides Quintilianus' *De musica*, and which defines both chromatic and enharmonic in terms of the diatonic:

τὸ χρωματικὸν γένος διατονικὸν ἐστὶν ηὐξημένον καὶ πεπυκνωμένον ἡμιτονίοις· τὸ δ' ἐναρμόνιον διατονικὸν ἐστὶ τόνῳ μὲν διπλασιασθέν, τῷ δ' ἡμιτονίῳ δίχα διηρημένον . . . χρωματικὸν δὲ καλεῖται παρὰ τὸ χρώζειν αὐτὸ τὰ λοιπὰ διαστήματα, μὴ δεῖσθαι δὲ τινος ἐκείνων.⁷²

The chromatic genus is the diatonic augmented and packed and condensed with semitones; and the enharmonic is the diatonic doubled at the tone, and divided in two at the semitone . . . And the chromatic is so-called from its coloring of the other intervals, when it does not actually need some one of them.

Note how both passages contain a double explanation of the chromatic, one described as a structural shift from the diatonic, the other as a milder sort of variation—as though two distinct musical practices were described by the same or similar terminology, or in crisis as to whether the chromatic deserves to be given separate classification. One thinks of Lysander of Sicyon's use, in the late Archaic or early

⁷¹ Anon. Bell. 2.26 (7.17f.).

⁷² [Aristid. Quint.] 2.19 (92.19-25); for the interpolation of this passage, see 2.21.

Classical period, of χρώματα εὔχροα (“colourful shadings”), a mysterious phrase which might also suggest some dichotomy within the chromatic.⁷³

- 7.34 The passage from Aristides Quintilianus also introduces ethical descriptions of each of the genera, the diatonic being “masculine and quite severe” (ἀρρενωπὸν δ’ ἐστὶ καὶ αὐστηρότερον), the chromatic “sweetest and plaintive” (ἡδιστὸν τε καὶ γοερὸν), the enharmonic “rousing” (διεγερτικὸν). The same conjunction of ideas is found again in Theon of Smyrna, where the source seems to be Adrastus. Here the diatonic is defined as “somewhat majestic, powerful . . . a bit simple, and noble” (σεμνὸν τι καὶ ἔρρωμένον . . . ἀπλοῦν τι καὶ γενναῖον),⁷⁴ while the chromatic is then presented in relation to it:

καλεῖται δὲ πάλιν τὸ γένος τῆς τοιαύτης μελωδίας χρωματικὸν διὰ τὸ παρατετράφθαι καὶ ἐξηλλάχθαι τοῦ πρόσθεν γοερώτερον τε καὶ παθητικώτερον ἦθος ἐμφαίνειν.⁷⁵

The genus of this sort of melody is in its turn called chromatic through having been altered [παρατετράφθαι] and transformed and from showing a more plangent and plaintive character than the previous genus [sc. the diatonic].

- 7.35 Note the verbal reminiscence here between παρατετράφθαι and παρὰ τὸ τετράφθαι in the Bellermin’s Anonymous quotation. With both of these compare παρέτρεψεν in Nicomachus’ roughly-contemporary explanation that the chromatic “diverges a little, only one semitone, from the diatonic” (μικρὸν γὰρ παρέτρεψεν, ἐν μόνον ἡμιτόνιον, ἀπὸ τοῦ διατονικοῦ).⁷⁶ This, or something similar in his lost work, is clearly the model for Boethius, who, after describing the diatonic as “harder and more natural” (*durius et naturalius*), derives the chromatic from it as “breaking from that natural tuning, as it were, and slipping into the more slack” (*quasi ab illa naturali*

⁷³ Philoch. *FGrH* 328F23 = Ath. 14.637f-638a. For the dates of Lysander, see West (1992), 69; Barker (1982-9), 1.300 n. 205. On Lysander’s contributions to music, see Barker (1982a).

⁷⁴ Adrastus ap. Theo Sm. 54.14, 56.4.

⁷⁵ Adrastus ap. Theo Sm. 55.4-7.

⁷⁶ Nicom. *Ench.* 12 (263.9f.).

intentione discedens et in mollius decidens).⁷⁷ Elsewhere, he too gives a dual explanation of the chromatic.⁷⁸

- 7.36 The same conception of the genera—their derivation from the diatonic combined with ethical properties appropriate to each—can be deduced from the *Hibeh Papyrus*:

λέγουσι δὲ ὡς τῶν μελῶν τ[ὰ] μὲν ἐγκρατεῖς, τὰ δὲ φρονίμους, τὰ δὲ δικαίους, τὰ δὲ ἀνδρείους, τὰ δὲ δειλοὺς ποιεῖ, κακῶς εἰδότες ὅτι οὔτε χρῶμα δειλοὺς οὔτε ἀρμονία ἂν ἀνδρείους ποιήσειεν τοὺς αὐτῇ χρωμένους. τίς γὰρ οὐκ οἶδεν [Ἀιτ]ωλοὺς καὶ Δόλοπας καὶ πάντας τοὺς θιύ[οντας] Θερμοπύλ[ησι] διατόνῳ μὲν τῇ μουσικῇ χρω[μένους, πολὺ] δὲ τῶν τραγωδῶν ὄντας ἀνδρειο[τέρους τῶν διὰ πα]ινιτὸς εἰωθότων ἐφ' ἀρμονίας ᾄδειν; [ὥστε δῆλον ὅτι οὔτε] χρῶμα δειλοὺς οὔτε ἀρμονία ἂν [ἀνδρείους ποιήσειεν.]⁷⁹

And they say how some μέλη make for self-controlled people, some thoughtful, some just, some courageous, and others craven, little knowing that the chromatic does not make those who use it craven, nor the enharmonic courageous. For who does not know that the Aetolians and Dolopes and all who sacrifice at Thermopylae make use of music which is diatonic—and they are much more courageous than the tragedians, who are accustomed to sing in the enharmonic every time? So it is clear that neither the chromatic would make people craven, nor the enharmonic brave.

This curious passage has aroused considerable surprise for its seemingly interchangeable treatment of the diatonic and chromatic as against the enharmonic.⁸⁰

⁷⁷ Boeth. *De inst. mus.* 1.21 (212.26-213.1).

⁷⁸ Boeth. *De inst. mus.* 1.21 (213.8-10): *chroma autem, quod dicitur color, quasi iam ab huiusmodi intentione prima mutatio, cantatur per semitonium, semitonium et tria semitonia* ("But the chromatic, which is to say 'colour', now a sort of alteration from the first method of tuning [i.e. the diatonic], is sung by semitone, semitone, and three semitones"). He continues (213.12-14): *tractum est autem hoc vocabulum, ut diceretur chroma, a superficiebus, quae cum permutantur, in alium transeunt colorem* ("but this term is drawn from surfaces which, when they are altered, go over to another color, so that it is called *chroma*").

⁷⁹ *PHib.* 13.13-22: text West (1992a), 16f.; for κακῶς εἰδότες, see the parallels cited by West *ad loc.*

⁸⁰ See the comments of Anderson (1966), 151; Barker (1982-9) 1.184 n.8; West (1981), 117; (1992), 247 n.84; (1992b), 20 *ad* 21-22.

A coherent reading is possible without this. That is, by showing that courageous peoples have resulted from diatonic rather than the enharmonic music espoused by the ἀρμονικοὶ who are under attack, their position as a whole is undermined, the alleged ethical properties of both enharmonic and chromatic collapsing together.⁸¹ But given the context, χρω[μένους at ii.19—the restoration is certainly correct given χρωμένους at i.17—is punning on χρῶμα. The sense would then be: “Who does not know that the Aetolians and Dolopes use/colour the diatonic (χρωμένους)? And *they* are courageous. So, clearly, the chromatic does not make one cowardly”. The speaker himself may have adduced this argument ironically, merely to make his point. But if the interpretation is correct—or simply if one accepts the *communis opinio* that the diatonic and chromatic are treated interchangeably—we may infer a contemporary conception quite close to that which underlies the other passages: the association of diatonic music with the manly, and the chromatic as a modification of the diatonic.

7.37 These passages share enough common detail, conceptual and verbal, that they must derive from a single theoretical position; this comprised at least the two subjects which the sources show to be inseparable: a definition of the genera as derived from the diatonic—including a double explanation of the chromatic—and an ethical property associated with each. At the same time these exemplars are rather diffuse, not being explicitly ascribed to any single theorist, and not showing the same well-drawn lines that we see in the repetition of Aristoxenean ideas. This suggests that they are fragmentary survivals of an early musical taxonomy which was partially obliterated by the success of Aristoxenus’ revisions. The ethical material, at any rate, derives from a fifth century trend, of which Damon is the notable representative; by association, this approach to generic analysis may be equally old. If one accepts an early fourth century date for the text of the *Hibeh Papyrus*, a solid historical foundation emerges for this strand of pre-Aristoxenean θεωρία.⁸²

7.38 At the same time, the explanation of the genera as diatonic modifications is consonant with Aristoxenean συνέχεια, with its imposition of minimum diatonic standards upon all heptatonic scales. The two positions are not opposed, then, but approach the same musical facts from different directions. The structural priority of the diatonic is also loosely recalled elsewhere by Nicomachus, who attributes to Pythagoras the analysis

81 For an alternate interpretation, see West (1992a), 20 *ad loc.*

82 For Damon and the dating of the text, see 2.37.

of the enharmonic and chromatic in light of what was known about the diatonic⁸³—the type of activity which, with better historical justification, may be attributed to Eratocles with his enharmonic octachord analysis on the basis of a diatonic cycle. Likewise, when Euclid presents only the basic procedure for establishing the diatonic tuning in the *Sectio Canonis*, one can assume that this provided only a rough preliminary framework for the other genera. And again, Ptolemy tells us precisely that “this is how the citharodes tune” (οὕτω γὰρ ἀρμόζονται οἱ κιθαρωδοί).⁸⁴

- 7.39 Thus, within Aristoxenus’ definition of ἀρμονική, the diatonic, being structurally fundamental, is justly described as the oldest of the genera, despite the fact that we must suppose the existence of non-diatonic lyre tunings as characteristic of the Homeric period—tunings which may themselves have dictated later syncretic forms. This may shed light on a curious statement in ps.-Plutarch, which seems to derive from Aristoxenus:

κιθάρα δέ πολλαῖς γενεαῖς πρεσβύτερα τραγωδίας οὔσα ἐξ ἀρχῆς ἐχρήσατο [sc. τῷ χρωματικῷ γένει]. τὸ δὲ χρῶμα ὅτι πρεσβύτερόν ἐστι τῆς ἀρμονίας. σαφές.⁸⁵

And the *cithara*, being many generations older than tragedy, used the chromatic genus from the beginning. And that the chromatic is older than the enharmonic is evident.

This agrees with Aristoxenus’ statement elsewhere that, prior to Olympus’ invention of the enharmonic in the early Archaic period, all music had been either diatonic or chromatic.⁸⁶ It seems to conflict, however, with the Aristoxenean chronology cited above, which made the diatonic older than the chromatic. But this might merely mean that, while the diatonic was original from a structural point of view, and ‘natural’ in its exclusive use of the primary resonant intervals, heptatonic shadings were part of the

⁸³ Nicom. *Ench.* 7 (249.4ff.): τὸ γὰρ χρωματικὸν καὶ ἐναρμόνιον γένος αὐθὶς ποτε ἐκ τούτου διетράνωσεν (“for from this [sc. the diatonic] he [sc. Pythagoras] clarified the chromatic and enharmonic at some later time”).

⁸⁴ Ptol. *Harm.* 2.1 (44.1ff.); cf. 1.16 (39.17f.): δύο γὰρ ποιοῦσι τοὺς ἡγουμένους τόνους καὶ τὸ λοιπὸν, ὥς μὲν αὐτοὶ νομίζουσιν, ἡμιτόνιον (“for they make the leading intervals two tones and the remainder, as *they* consider it, a semitone”).

⁸⁵ Ps.-Plut. *de Mus.* 1137e.

⁸⁶ Aristox. fr. 83.

τέχνη from the start—whether from the influence of native Greek practice, or because this was part and parcel of Asiatic music, or both.

7.40 To return to the πρώται συμφωνίαι, there is another point which is sympathetic to the Mesopotamian tradition. It was stated above that ἡ [συμφωνία] διὰ πέντε and ἡ [συμφωνία] διὰ τεττάρων make consistent sense only in the diatonic genus. To be precise, however, the names *almost* make sense. For, as in the Mesopotamian system, one fourth or fifth in a diatonic tuning must always be the non-consonant, ‘unclear’ tritone. It is for this one interval that, besides the need for legitimizing the conjunction and disjunction of the microtonal tetrachords found in the enharmonic and chromatic genera, Aristoxenus must allow that “consonant respension” be by fifth and/or fourth. Of course, this one exception would not prevent the creation of the terms ἡ [συμφωνία] διὰ πέντε and ἡ [συμφωνία] διὰ τεττάρων, since the one non-consonant fourth or fifth is greatly outnumbered by the remaining consonant intervals. Nevertheless, it was necessary to recognize that an interval of four or five strings might not actually be a ‘fourth’ or ‘fifth’ in the usual sense, and for this Aristoxenus used the expression τὸ [sc. διάστημα] διὰ πέντε.⁸⁷

7.41 Thus the very names assume that intervals of five and four strings will be consonant. The one non-consonant fifth which must arise is excluded from this classificatory norm and put into a sort of onomastic isolation. This is in fact the precise dichotomy we find in the Mesopotamian labels ‘clear’ and ‘unclear’. Although the terminology is different, it as though we were glimpsing the Mesopotamian conception through a palimpsest. For the Greek names of the consonances exclude any original relationship with what we consider to be the characteristically Greek tunings. The generalizing nature of the terms implies that it would be normal to find consonant fifths or fourths in any and every position of a proper μέλος ἡρμωμένον. As a consequence, the non-consonant interval which must arise in diatony may also appear in any position. This is oblique confirmation that the diatonic phases were in fact known in the heptachordal period.

⁸⁷ Aristox. *Harm.* 48; cf. 21-2: δεῖ δὲ νοῆσαι τῶν συμφώνων διαστημάτων <τὸ> ἐλάχιστον τὸ κατεχόμενον τὰ τε πλεῖστα ὑπὸ τεττάρων φθόγγων, ὅθεν δὴ καὶ τὴν προσηγορίαν ὑπὸ τῶν παλαιῶν ἔσχε (“And it is necessary to consider the smallest of the consonant intervals, that which is comprised *for the most part* by four notes, which is in fact why it had this name from the ancients”).

7.42 This conclusion cannot be dismissed simply on the grounds that such a binary perspective is in the nature of the diatonic tuning method. It is true that the process universally yields the same general type of pitch relationships—that is, scales of tones and semitones with consonant parallelism and a single unparallel tritone. But it does not follow that two musical traditions should develop identical musical and terminological perspectives, since this would depend on the musical use to which these scales are put. Other viable perspectives which are excluded here are, for example, an Archytean ‘tempering’ of heptatony towards the finer resonant intervals. Once tempered, intervals might be classified by relative resonance, with an eye towards heterophony, as Crocker (1978) argued for *UET* VII/74 col. i. As in CBS 10996, each interval might be given a separate name so that in a written description of a tone-structure, such as the Retuning Text, the exact position of the tritone might be specified—such an innovation would not be necessary for the aurally-inclined practicing musician, for whom ‘interval rotation’ was demonstrable without any diagram. Or one might expect to find a nomenclature which could acknowledge a relationship between the very particular diatonic pitch-structure and other tunings that were in use; and yet the genera themselves exhibit essential diatonic characteristics. But perhaps the most important point: to dismiss such terminological and conceptual parallels by appeal to the ‘universal’ properties of diatony is to ignore the fact that this tuning method is not itself universal. It is not, as Aristoxenus would agree, predetermined by nature but culture-specific and idiosyncratic; its very existence in more than one culture being evidence of historical relationship.

7.43 To return now to the process of interval rotation known to Eratocles and his contemporaries, there is another important fact that reveals the foundational importance of the cyclical conception both for and before Aristoxenus. This is the term *συνέχεια* itself, which came to Aristoxenus via Aristotle, for whom ‘the continuous’ was a key critical concept:

λέγω δ' εἶναι συνεχές ὅταν ταῦτὸ γένηται καὶ ἐν τὸ ἐκατέρου πέρασ οἷς ἄπτονται καὶ ὥσπερ σημαίνει τοῦνομα, συνέχεται· τοῦτο δ' οὐχ οἷόν τε δυοῖν ὄντοιν εἶναι τοῖν ἐσχάτοιν. τούτου δὲ διωρισμένου φανερόν ὅτι ἐν τούτοις ἐστὶ τὸ συνεχές, ἐξ ὧν ἐν τι πέφυκε γίγνεσθαι κατὰ τὴν σύναψιν. καὶ ὥς ποτε γίγνεται τὸ συνέχον ἐν, οὕτω καὶ τὸ ὅλον ἔσται ἐν.⁸⁸

I mean to say that ‘continuous’ is when, for things which are touching each other, the boundary of each is one and the same, and, as the name suggests, is ‘held together’ [συν-εχ- = together-hold]. And this is not possible when the extremes are two distinct things. When so defined, it is clear that the continuous exists only in those things from which one thing can naturally arise through being in contact. And however the continuous becomes a single thing, that is how the whole too will be a single thing.

7.44 Scholars have explained musical συνέχεια as describing the component pitches of a tuning, that is, τὸ ἡρμωσμένον is ‘continuous’ because no other pitches can be inserted between those which compose it: each interval shares a single string with the two adjacent intervals.⁸⁹ This is certainly true, and derives from the literal adjacency of strings on a heptatonic lyre (cf. 9.32). But I believe this is merely a corollary of what is intended. For συνέχεια cannot be created *without* “consonant responsion”, and yet fulfillment of this rule does not alone guarantee συνέχεια: imagine a μέλος which has consonant responsion, but for which the interior “movable” pitches (φθόγγοι κινούμενοι) do not constitute a recognised genus. Yet such a tuning would still exhibit ‘continuity’ according to the usual interpretation of συνέχεια.

7.45 I suggest, therefore, that συνέχεια governs not merely the continuity of pitches within a scale, but the continuity of the scale as a whole in reference to something larger than itself. The key evidence here comes from a corollary of συνέχεια:

ᾧ δ’ ἂν τῶν φθόγγων μηδὲν ἢ τούτων συμβεβηκός. ἐκμελῇ τοῦτον εἶναι πρὸς
(τού)τους οἷς ἀσύμφωνός ἐστιν.⁹⁰

And for whichever of the pitches none of these conditions apply, this pitch is ἐκμελῇ towards those pitches with which it is not consonant.

ἐμμελής and ἐκμελής normally refer to the individual pitches of a tuning which conforms to συνέχεια; they are either “in” or “out” of the μέλος ἡρμωσμένον. Thus the terms appear frequently in Book 3, where Aristoxenus gives pitch-by-pitch accounts of the genera. While this meaning obtains in the present passage, there is a further dimension. The immediate focus is on a single μέλος ἡρμωσμένον: properly ‘continuous’, each of its pitches must enjoy consonant responsion to some other pitch and so be ἐμμελής in the primary sense. But the qualification is introduced that a pitch

⁸⁹ Cf. Barker (1982-9), 2.101.

⁹⁰ Aristox. *Harm.* 29; for τούτους vs. τοὺς, see Da Rios’ apparatus.

may be ἐκμελής towards any of its companions if there is no consonant responsion between them. Clearly, this corollary looks to the interrelationship of more than one μέλος. The two pitches which are ἐμμελῆ in the context of their own μέλος are ἐκμελῆ in the context of another μέλος, by not exhibiting the consonant responsion which would define it.

- 7.46 Hence, συνέχεια governs not merely the cohesion of pitches within a μέλος, but that of a μέλος within a system of μέλη—as made possible by rules of consonance ultimately dependent upon diatony. It is, moreover, in complete accord with the process of interval rotation; for, according to Aristotle’s definition, only circular motion can be truly ‘continuous’.⁹¹ But cyclical συνέχεια has its roots in pre-Socratic thought, as an essential aspect of Parmenides’ sphere, for example:

οὐδὲ διαιρετόν ἐστιν, ἐπεὶ πᾶν ἐστιν ὁμοῖον·
οὐδέ τι τῇ μᾶλλον, τό κεν εἴργοι μιν συνέχεσθαι,
οὐδέ τι χειρότερον, πᾶν δ’ ἔμπλεόν ἐστιν ἐόντος.
τῷ συνεχῆς πᾶν ἐστιν· ἐὼν γὰρ ἐόντι πελάζει.⁹²

And it is not divisible, since it is all the same;

And it is not somewhat more in this place, which would prevent it from being continuous,

And it is not somewhat less in that, but the whole is filled with being.

In this way it is all continuous: for that which moves towards that which is.

- 7.47 While Aristoxenean συνέχεια thus represents the late development of an ancient concept, we may find a hint of the musical reality which συνέχεια describes as early as the Homeric *Hymn to Hermes*:

⁹¹ Arist. *Ph.* 8.8.265a8f.: κατ’ οὐδεμίαν κίνησιν ἐνδέχεται κινεῖσθαι συνεχῶς ἔξω τῆς κύκλῳ; 8.8.264b9 ἡ δ’ ἐπὶ τῆς περιφεροῦς ἔσται μία καὶ συνεχής; cf. Heraclit. fr. 22B103 D-K: ξυνὸν γὰρ ἀρχὴ καὶ πέρασ ἐπὶ κύκλου περιφερείας (“in the circumference of a circle the beginning and end are common”); ps.-Arist. *Mech.* 848a6ff.: ἐξ οὗ γὰρ ἄρχεται τόπου τὸ πέρασ αὐτῆς [*sc.* τῆς γραμμῆς], εἰς τὸν αὐτὸν τοῦτον τόπον ἔρχεται πάλιν· συνεχῶς γὰρ κινουμένης αὐτῆς τὸ ἔσχατον πάλιν ἀπῆλθε πρῶτον (“For from whatever place the boundary (of a drawn circle) begins, it goes back again to the very same place: for when it moves continuously [*συνεχῶς*], the final point arrives back at the first point”).

⁹² Parm. fr. 28B8.22-25 D-K.

καὶ πήχεις ἐνέθηκ', ἐπὶ δὲ ζυγὸν ἤραρεν ἀμφοῖν
 ἑπτὰ δὲ συμφώνους ὁίων ἐτανύσσατο χορδὰς . . .
 πλήκτρῳ ἐπειρήτιζε κατὰ μέλος.⁹³

And he put in the arms, and joined (ἤραρεν) a yoke upon them both,
 And stretched seven consonant strings of sheepgut . . .
 He tested it with the plectrum κατὰ μέλος.

The MSS have κατὰ μέρος here, but the same phrase recurs at 419 and 501 where the reading is in both cases κατὰ μέλος. Allen/Halliday/Sikes (1936) thus gave κατὰ μέλος “the balance of evidence”.⁹⁴ As Càssola (1975) pointed out, this is counteracted by the fact that μέλος, in a musical sense, is not Homeric.⁹⁵ Nevertheless, the parallels at 419 and 501 are persuasive since an error of μέρος for μέλος would be easy to make. The real question, then, is whether μέλος makes better sense in the context.

- 7.48 Since the testing is done specifically with the plectrum, the reference must be, whatever the reading, to the tuning of the strings, to see whether they are εὖ καὶ ἐπισταμένως. This was precisely what Odysseus did to test his bow, when the string sang like a sparrow in the returning spring (cf. 5.16). Accordingly Càssola, who reads κατὰ μέρος, takes it to mean that Hermes checks the tuning string by string.⁹⁶ But here the reading μέλος is greatly preferable since it, rather than μέρος, can denote a musical tuning—in fact it seems to have been the word of choice at this period, in preference to ἀρμονία.⁹⁷ Now, if it is right to allow συμφώνους its usual technical sense (cf. 2.24), it follows that Hermes is testing that each string is “well and knowledgeably tuned” in some consonant relationship. We can take Lucian effectively glosses the *Hymn* when he replaces ἑπτὰ δὲ συμφώνους οἴων ἐτανύσσατο χορδὰς with ἐντεινόμενος ἑπτὰ χορδὰς μελωδεῖ . . . ἐναρμόνιον (“stretching seven strings thereon, he sang . . . precisely in tune”).⁹⁸ That is, each consonant string (σύμφωνος χορδή) is just as it should be (ἐναρμόνιος).

93 *H. Merc.* 50-53.

94 Allen/Halliday/Sikes (1936), *ad loc.*

95 Càssola (1975), *ad loc.*

96 Càssola (1975), *ad loc.*

97 See West (1992), 177 and n. 57.

98 Lucian *DDeor.* 11.4.

- 7.49 What is the purposeful manner of tuning implied here? The phrase κατὰ μέλος is the key. In Classical times a technical expression in its own right, occurring four times in Aristoxenus (thrice in the *Elementa Harmonica*, once in the *Elementa Rhythmica*⁹⁹), where it is closely allied with the rule of συνέχεια. Significantly, all three examples in the *Elementa Harmonica* come from the same discussion. The first of these was quoted above; the remaining two I give here:

οὐ δὴ προσεκτέον εἰ τὸ συνεχὲς ὅτε μὲν ἐξ ἴσων ὅτε δ᾽ ἐξ ἀνίσων γίγνεται, ἀλλὰ πρὸς τὴν τῆς μελωδίας φύσιν πειρατέον βλέπειν κατανοεῖν τε προθυμούμενον τί μετὰ τί πέφυκεν ἡ φωνὴ διάστημα τιθέναι κατὰ μέλος.¹⁰⁰

Do not be alarmed if “the continuous” arises sometimes from equal [intervals] and sometimes from unequal: one must try to look to the nature of melody and be ready to understand which interval naturally comes after which when the voice puts them together κατὰ μέλος.

ὑποκείσθω δὲ καὶ τοὺς τοῖς ἐξῆς φθόγγοις συμφωνοῦντας διὰ τῆς αὐτῆς συμφωνίας ἐξῆς αὐτοῖς εἶναι. ἀσύνθετον δὲ ὑποκείσθω ἐν ἐκάστῳ γένει εἶναι διάστημα κατὰ μέλος ὃ ἡ φωνὴ μελωδοῦσα μὴ δύναται διαιρεῖν εἰς διαστήματα.¹⁰¹

And let it also be that those tones which are consonant with “continuous” tones, each through the same consonance, are continuous with each other. And in each genus an interval will be “incomposite” κατὰ μέλος when the voice in singing cannot break it apart into [smaller] intervals.

- 7.50 The diatonic essence of συνέχεια is further corroborated here by Aristoxenus’ appeal to “the nature of melody” (τὴν τῆς μελωδίας φύσιν), recalling his description of the diatonic as open to discovery by human nature (ἡ τοῦ ἀνθρώπου φύσις). Elsewhere he states that there is “a certain nature of the cohesive/continuous in melody” (τις φύσις . . . τοῦ συνεχοῦς ἐν τῇ μελωδίᾳ).¹⁰² Likewise, he criticized his predecessors for not showing which sequences would be “contrary to nature” (παρὰ φύσιν), in other

99 Aristox. *Rhythm.* 2.21; the examples from *Harm.* are given below.

100 Aristox. *Harm.* 28.

101 Aristox. *Harm.* 29.

102 Aristox. *Harm.* 27.

words, for not formulating the rule of συνέχεια. This explains his statement that none of the genera is any more natural than another, for all rest upon the same natural foundation—the diatonic. Nicomachus too described the diatonic progression as dictated by “a certain natural necessity” (ἀνάγκη τινὶ φυσικῇ).¹⁰³ Intervals of a μέλος ἡρμωσμένον conforming to συνέχεια occur in certain sequences “along the tuning”, or which are “in the μέλος”, where κατὰ μέλος may be contrasted with the phrase παρὰ μέλος, “missing the μέλος”.¹⁰⁴ The exact sequence will vary with the genus, but in each case ‘symphonic response’ is observed κατὰ μέλος. It is this structure which Aristoxenus described as “a certain marvelous arrangement of the nature of the μέλος ἡρμωσμένον” (τάξιν . . . τινὰ . . . τῆς φύσεως τοῦ ἡρμωσμένου θαυμαστήν).¹⁰⁵ Thus μέλος ἡρμωσμένον and μέλος itself emerge as technical terms expressly allied to diatony, and being continuous/cohesive κατὰ μέλος assumes these diatonic structures as an underlying norm, generic variations notwithstanding.

- 7.51 Can one read a similar technical meaning into κατὰ μέλος in the *Hymn to Hermes*? Not that there is any awareness of Aristoxenean συνέχεια *per se*. But the reverse is conceivable: the Aristoxenean rule made the μέλος ἡρμωσμένον conform to a certain standard of construction which was of fundamental importance in practical music, one which *could* be implied in the *Hymn*. For “testing it along the μέλος” (ἐπειρήτιζε κατὰ μέλος) clearly shows that some definite tuning is intended, i.e. that which is implied by ἐπτὰ δὲ συμφώνους ὁῶν ἐτανύσσατο χορδὰς. Compare [μέλος] σύμφωνον in Sophocles’ adaptation of the tale, which—if Wilamowitz’ conjecture is correct—serves to bridge the two phrases.¹⁰⁶ Σύμφωνον μέλος is perhaps unspecific enough that it could equally describe the other μέλη ἡρμωσμένα allowed by Aristoxenus, enharmonic and chromatic. But, as I have argued (2.25), ἐπτὰ συμφώνους χορδὰς has a collective implication which suggests that the seven strings are linked throughout by mutual consonant relations, as opposed to the isolated

¹⁰³ Nicom. *Ench.* 7 (249.1-3): τὴν δὲ πρόβασιν ἀνάγκη τινὶ φυσικῇ . . . κατὰ τοῦτο τὸ διατονικὸν γένος (“the progression by some physical necessity . . . along this diatonic genus”).

¹⁰⁴ Variations of the phrase appear in similar contexts: Nicom. *Ench.* 7 (249.1ff.), quoted above; ps.-Plut. *de Mus.* 1140f.: Δώριον νήτην προσετίθουσιν, οὐ χρησασμένων αὐτῇ τῶν ἑμπροσθεν κατὰ τὸ μέλος (“[sc. Terpander] added Dorian νήτη, his predecessors not using it in the μέλος”); Pl. *Lg.* 801c uses κατὰ μέλος differently, to describe composition “in music”.

¹⁰⁵ Aristox. *Harm.* 42.

¹⁰⁶ S. *Ichn.* 319 (Lloyd-Jones); contrast 327 (Maltese).

consonant response that characterizes the non-diatonic genera. The diatonic proper—oldest and most natural—may be safely inferred here as being the μέλος ἡρμοσμένον *par excellence*, the prime exemplar of συνέχεια κατὰ μέλος.

- 7.52 Far from being untechnical (cf. 2.24), the invention scene in the *Hymn to Hermes* attests the harmonic construction of the lyre (cf. 4.15-18), the association of συμφωνία and ἁρμονία (cf. 4.17), and an implicit understanding of how consonance is to be set up and tested, and what sort of tuning should properly result—all this before Lasus committed his θεωρία to writing. With these details and its fragments of epic technical language (cf. 5.14-19), the *Hymn* bridges the gap between the seven-stringed lyre of the Orientalizing period and the codification of συνέχεια by Aristoxenus. The period between Terpander and the *Hymn* itself—whatever its exact date—is spanned by the Lesbian school, whose dynasty reigned supreme into the sixth century, preserving the first principles of the Orientalizing musical movement in its classical form, as symbolized by Terpander. Against this background we can understand better the terse detail of the *Hymn*. The poet is not uninterested in or unknowledgable of technical musical material. Rather, the full reality of contemporary practice would be readily evoked in the mind of the musically knowledgable by a few sure strokes. And who would better know such things than the lyre-playing αἰδός himself?
- 7.53 The testimonia which concern μεταβολή provide further evidence that the σύστημα τέλειον was founded upon an earlier diatony, the ‘continuity’ of whose scales had already allowed them to be fully interrelated. According to an earlier precept which Aristoxenus attributed to Eratocles, acceptable modulation (μεταβολή) could only take place at consonant “intersections”:

ἀπὸ τοῦ διὰ τεσσάρων ἐφ’ ἑκάτερα δίχα σχίζεται τὸ μέλος

From the fourth the *melos* splits in two in either direction.¹⁰⁷

ἀπὸ πυκνοῦ δ’ ἐναντίως ἐπὶ μὲν τὸ βαρὺ δύο ὁδοί, ἐπὶ δὲ τὸ ὀξύ μία

After the *pyknon* [*sc.* when descending] there are, in opposite directions, two roads continuing the descent and another one that goes back up.¹⁰⁸

107 Aristox. *Harm.* 5.

108 Aristox. *Harm.* 67. I have expanded the translation to make the laconic wording clearer.

- 7.54 An important fragment of Ion of Chios confirms that this approach to modulation was standard practice not later than 422 B.C., when Ion died, and probably by his *floruit* mid-century:

ένδεκάχορδε λύρα, δεκαβάμονα τάξιν ἔχουσα
τάς συμφωνούσας ἀρμονίας τριόδους·
πρὶν μὲν σ' ἐπτάτονον ψάλλον δις τέσσαρα πάντες
"Ἕλληνες σπανίαν μοῦσαν ἀειράμενοι.¹⁰⁹

eleven-stringed lyre with a ten-stepped arrangement—

the three-way, consonant crossroads of ἀρμονία.

Hitherto all the Greeks played you heptatonic—two tetrachords—
summoning up a sparse Muse.

This is the earliest testimony for the tetrachordal perspective, fundamental to the later theorists. It corresponds very closely, moreover, to the Eratoclean conception of μεταβολή as a melodic road which splits at consonant intersections, with three choices (besides the one just travelled). Once again, of course, there is the conjunction of ἀρμονία and συμφωνία. A careful analysis of Aristotle *Physics* 8.8, which addresses linear and rotational motion, 'continuity', issues of 'middle-point' and "deflected" (ἀνακάμπτον) movement, would doubtless help to elucidate further Aristoxenus' conception of musical συνέχεια, as well as the crucial issues which concern the ancient θεωρία—in particular, musical 'middle-point' and the bending of the melodic path (καμπή), by which the basic form of modulation was effected.

¹⁰⁹ Ion of Chios fr. 32 (West) = Cleonid. 12 (202.14-17). I prefer δις to διὰ because δις τέσσαρα more clearly glosses ἐπτάτονον. A number of sources describe the old heptachord as consisting of two tetrachords sharing μέση as a common tone (i.e. II-PH-L-M-PM-PN-N); in the oldest of these sources it is not necessarily the later conjunctive paradigm—where the strings are consonant διὰ τεσσάρων—which is intended: see further 8.36-38. Cf. ps.-Arist. *Pr.* 19.47: διὸ καὶ μέσῃν αὐτὴν προσηγόρευσαν, ὅτι ἦν τοῦ μὲν ἄνω τετραχόρδου τελευτή, τοῦ δὲ κάτω ἀρχή ("which in fact is why they called it μέση, because it was the last string of the upper tetrachord and the beginning of the lower"); Boeth. *De inst. mus.* 1.20 (207.29ff.): *mesen nervum secundo numeramus. Atque ideo duo tetrachorda per mesen coniunguntur.* Arist. *Ph.* 8.8 also discusses in non-musical terms the use of a mid-point as both a beginning and an end.

- 7.55 According to the rule of melodic ‘junctions’, modulation in the enharmonic and chromatic genera can only take place at the consonant “bounding” notes of each tetrachord (οἱ περιέχοντες φθόγγοι), not from the variable, “moving” inner notes (οἱ κινούμενοι) whose intonation was so often microtonal. In the διάτονον γένος, however, each φθόγγος is by definition such an intersection, and so can serve as a departure point for μεταβολή. Created by the strictest application of συνέχεια—Ptolemy’s διατονικοῦ συνεχοῦς—the diatonic served as the skeleton of the σύστημα τέλειον, regulating, indeed enabling, modulation between the various συστήματα of the enharmonic and chromatic in all their shades. Thus the fragment implies knowledge of the complete diatonic connectability of all the species, at approximately the same time that Eratocles was rotating the enharmonic octachords. Once again his researches are seen against a diatonic background.
- 7.56 Given that Aristoxenus was musically conservative, railing against the practices of his day and prepared to sacrifice popularity for purity of technique,¹¹⁰ it follows that his contemporaries, for whom the New Music was now becoming mainstream,¹¹¹ were pursuing modulations and joining pitch systems that transgressed the rule he lays down. If this is right, his allowance for modulation represents an older, classical practice known to Ion and Eratocles. What is surprising about this is that scholars generally assume that the New Music was objectionable because it involved modulation. It now appears that modulation was a regular part of music prior to this movement, and that the New Music was controversial because it used too much modulation, or/and modulations which were improperly constituted.
- 7.57 In fact, as early as the early sixth century (!), according to Heraclides of Pontus, the aulete Sacadas of Argos—a renowned musician from a musical city, with three consecutive Pythian victories under his belt—was modulating with each strophe of his τριμελής νόμος (“Etude in Three Tunings”).¹¹² Lasserre (1998) made much of this,

110 Cf. Aristox. frr. 70, 76, 85.

111 West (1992), 371f.

112 Ps.-Plut. *de Mus.* 1134b. According to ps.-Plut. *de Mus.* 1131f-1132c, Heraclides, for his *Συναγωγή τῶν ἐν μουσικῇ* (“Compilation of Musical Matters”), drew upon a document preserved at Sicyon which contained a list of poets and musicians from Argos (fr. 157 Wehrli). Sacadas’ victories began in the third year of the forty-eighth Olympiad (thus 586, 582 and 578): Paus. 10.7.4-5 (cf. 2.22.8-9); ps.-Plut. *de Mus.* 1134a; cf. West (1992), 212. Argos, which was home to Aristonicus, a contemporary of Archilochus who pioneered the art of solo-cithara playing (Menaechmus *FGrH* 131F6 = Ath. 14.637f), seems to have enjoyed a musical efflorescence in the sixth century. Herodotus (3.131-2)

noting that, despite the fact that the ethnic names Dorian, Lydian and Phrygian suggest *prima facie* independent geographical origins for these tunings, they must nevertheless have been somehow mutually compatible, implying a unified musical system which could accomodate diverse tunings.¹¹³ We cannot say certainly what “Dorian, Lydian and Phrygian” mean in this context.¹¹⁴ Nor do we have any precise information regarding the “multiplicity of αὐλός notes” (τῇ τῶν αὐλῶν πολυφωνίᾳ) used in the late sixth century by his countryman Lasus of Hermione.¹¹⁵ Yet both testimonia are clear evidence that the particular acoustic properties of the αὐλός profoundly affected the course of ἁρμονική (cf. 1.24). A lyre used for such ‘polyphonic’ pieces, if it were to avoid retuning between strophes or elaborate mechanisms like the “tripod” of Pythagoras of Zacynthus,¹¹⁶ would require more strings than the traditional seven—nine in the case of the τριμελὴς νόμος. In fact, such an instrument is already attested in the mid-sixth century.¹¹⁷ At any rate, we have here good evidence for modulation well back into the Archaic—indeed, at approximately the same time that σύμφωνοι χορδαί and κατὰ μέλος surface in the *Hymn to Hermes*.

reports that, in the time of Polycrates, “the Argives were held to be first among the Greeks in music” (Ἀργεῖοι ἤκουον μουσικὴν εἶναι ἑλλήνων πρῶτοι). Sacadas and others established at Argos the festival called τὰ ἐνδυμάτια (ps.-Plut. *de Mus.* 1134b-c). It may have been at this time that the Greek musical notation first took form, since a number of its peculiarities are best traced to the archaic Argive script: see West (1992), 261ff.; cf. 5.18. Lasus of Hermione, who emerges as an important and innovative musician at the end of the century, was also from the Argolid, as was Telesilla.

113 Lasserre (1988), 82: “[il *trimeles nomos*] presuppone, accanto ad una tecnica relativamente facile da mettere a punto sull’aulo, una teoria della scala musicale che identificava già perfettamente la funzione degli intervalli nella trasposizione. Questa teoria presuppone a sua volta una struttura comune ai tre modi armonizzati da Sacada, in altri termini un’origine comune”.

114 It is not clear whether these three names were preserved with the original tradition, or have been introduced anachronistically. Ps.-Plut. (*de Mus.* 1134a) claims that these were the only three tunings known at the time, a belief attested in other late sources, e.g. Ptol. *Harm.* 2.6 (56.4ff.), 2.10 (62.19f.). Thus these specific tunings may be mere inference from the name τριμελὴς νόμος. Curiously enough, Heraclides of Pontus, who seems to be the source here, insisted elsewhere that the three true ἁρμονίαι should correspond to the three Hellenic races, Dorian, Ionian and Aeolian: see Ath. 14.624c.

115 Ps.-Plut. *de Mus.* 1141c.

116 Ath. 14.637c-f.

117 Paris E643; cf. Maas and Snyder (1989), 38, 51 fig. 15a; West (1992), 62.

7.58 It would seem then that Pindar—who also celebrated the παμφωνία or πολυφωνία of the αὐλός¹¹⁸ and musical ποικιλία (a word glossed by ps.-Plutarch as πολυχорδία¹¹⁹), and was said to have been a student of Lasus¹²⁰—was no stranger to μεταβολή. Even the austere, heptachordal Aeschylus may well have used modulation. This would have been under certain well-defined conditions at first—between strophes for instance, following the example of Sacadas. In a well-known fragment of Pherecrates, Music complains of the progressive indecencies she has suffered during the course of the fifth century from the likes of Melanippides, Cinesias, and Phrynis—with her ultimate violation at the hands of Timotheus who, with Philoxenus, was the quintessential New Musician. These crimes are recounted in language rife with sexual and musicological puns. Of Cinesias, the effeminate dithyrambist of the later fifth century, she says:

Κινησίας δέ <μ> ὁ κατάρατος Ἀττικός,
 ἐξαρμονίους καμπὰς ποιῶν ἐν ταῖς στροφαῖς.
 ἀπολώλεχ' οὕτως, ὥστε τῆς ποιήσεως
 τῶν διθυράμβων, καθάπερ ἐν ταῖς ἀσπίσιν,
 ἀριστερ' αὐτοῦ φαίνεται τὰ δεξιὰ.¹²¹

And Cinesias, that damned Athenian,
 Making exharmonic bends in his strophes,
 So destroyed me that in the composition
 Of his dithyrambs—as with [the reflection of] shields—
 The left appears in the same spot as the right.

7.59 It is universally acknowledged that ἐξαρμονίους καμπὰς are modulations; as 'exharmonic' suggests, these are pitches which do not occur within a given ἁρμονία; a ἁρμονία which, on the basis of the Aristophanic material discussed above (7.18), we may presume to be heptachordal. If interstrophic modulation was accepted practice since the time of Sacadas, the criticism ἐν ταῖς στροφαῖς becomes intelligible as a

118 Pi. *I.* 5.27, *O.* 7.12, *P.* 12.19: αὐλῶν . . . πάμφωνου μέλος; cf. *Adesp.* 29b (*PMG* 947): πολύχορδος αὐλός; Pl. *Resp.* 3.399c-d.

119 Ps.-Plut. *de Mus.* 1137a.

120 See West (1992), 344 n.68.

121 Pherec. fr. 155.8-12 K-A.

violation of convention.¹²² Moreover, the images of invertibility and reflection fit well with a circular conception of μεταβολή and συνέχεια. In *Birds*, Aristophanes brings together the image of road and circle in his travesty of Cinesias and the modern dithyrambic style.

- KIN.: πέτομαι δ' ὁδὸν ἄλλοτ' ἐπ' ἄλλαν μελέων . . .
 PEIS.: ἀσπαζόμεσθα φιλύρινον Κινησίαν.
 τί δεῦρο πόδα σὺ κυλλὸν ἀνὰ κύκλον κυκλεῖς;¹²³
- CIN.: I fly on first one and then another road of μέλη . . .
 PEIS.: We welcome thee, lime-wood Cinesias.
 Why do you come here circling your lame foot round the circle?

The language is complex. Though the primary reference of τί δεῦρο πόδα σὺ κυλλὸν ἀνὰ κύκλον κυκλεῖς—with the punning language of κυλλὸν (“lame”) and κύκλον (“circle”)—seems to be the halting, modernist dance of a circular dithyrambic chorus,¹²⁴ it combines with ὁδὸν μελέων (the melodic path) to form a gloss on the modulatory nature of the music (πέτομαι δ' ὁδὸν ἄλλοτ' ἐπ' ἄλλαν). This serves to confirm the interpretation of Pherecrates' καθάπερ ἐν ταῖς ἀσπίσιν, / ἀριστέρ' αὐτοῦ φαίνεται τὰ δεξιὰ and the familiarity of cyclic modulation prior to Aristoxenus, as emphasized by the pleonastic and frequentative ἀνὰ κύκλον κυκλεῖς.

- 7.60 Thus what distinguished the interstrophic modulation of Sacadas from the μεταβολή of the later fifth century was not the basic principle of an interrelationship between two tunings, but the reckless abandon with which the New Musicians crossed from one to the next, breaking down all distinctions in the ἀρμονίαι. Sacadas moved from one

¹²² Cf. D. H. *Comp.* 19 (194.5-196.7 Roberts): τοῖς δὲ τὰ μέλη γράφουσιν τὸ μὲν τῶν στροφῶν τε καὶ ἀντιστροφῶν οὐχ οἶόν τε ἀλλάξαι μέλος, ἀλλ' ἐάν τ' ἐναρμονίους ἐάν τε χρωματικὰς ἐάν τε διατόνους ὑποθῶνται μελωδίας, ἐν πάσαις δεῖ ταῖς στροφαῖς τε καὶ ἀντιστρόφοις τὰς αὐτὰς ἀγωγὰς φυλάττειν . . . οἱ δὲ γε διθυραμβοποιοὶ καὶ τοὺς τρόπους μετέβαλλον. Δωρίους τε καὶ Φρυγίους καὶ Λυδίους ἐν τῷ αὐτῷ ᾄσματι ποιοῦντες, καὶ τὰς μελωδίας ἐξήλλαττον, τοτὲ μὲν ἐναρμονίους ποιοῦντες, τοτὲ δὲ χρωματικὰς, τοτὲ δὲ διατόνους . . . οἷ γε δὴ κατὰ Φιλόξενον καὶ Τιμόθεον καὶ Τελεστήν, ἐπεὶ παρὰ γε τοῖς ἀρχαίοις τεταγμένος ἦν καὶ ὁ διθύραμβος.

¹²³ Ar. Av. 1374-9; cf. Anacr. fr. 33 (PMG 378).

¹²⁴ See Dunbar (1995), *ad* 1379.

ἁρμονία to another; the New Music was ‘exharmonic’, not belonging to an identifiable heptachordal ἁρμονία. We learn from ps.-Plutarch that

τὸ δ’ ὅλον ἢ μὲν κατὰ Τέρπανδρον κιθαρῳδία καὶ μέχρι τῆς Φρύνιδος ἡλικίας παντελῶς ἀπλῇ τις οὔσα διετέλει· οὐ γὰρ ἐξῆν τὸ παλαιὸν οὕτως ποιεῖσθαι τὰς κιθαρῳδίας ὥς νῦν οὐδὲ μεταφέρειν τὰς ἁρμονίας καὶ τοὺς ῥυθμούς· ἐν γὰρ τοῖς νόμοις ἐκάστω διετήρουν τὴν οἰκείαν τάσιν.¹²⁵

In general, the style of citharody practiced by Terpander persisted even unto the time of Phrynis as one which was altogether simple. For in the old days it was not allowed to make citharodic compositions like today, nor to transfer the ἁρμονίαι and the rhythms [*sc.* beyond their proper boundaries]. For in the *nomoi* they guarded the proper tuning for each.

- 7.61 As we recall, the practice of adhering to one diatonic tuning for each piece is attested in the Assyrian song catalogue VAT 10101 (1.18, 5.21, 6.17); the same was probably true of the Hurrian hymns, to judge from the cult song to Nikkal, which was in the *nīd qabli* tuning (cf. 2.9, 5.22). But though the Archaic composers’ were reluctant to “transfer the ἁρμονίαι”, it does not follow that they were unaware of how the tunings were structurally interconnected—just as the compilers of VAT 10101 knew of seven distinct tunings, whose connectivity was celebrated in the Retuning Text (cf. 1.20). Again the reference is to αἱ ἁρμονίαι, *the* tunings. (Note too that ps.-Plutarch’s source did not use the normal Aristoxenean term for modulation, μεταβάλλειν.) Thus we read later in the same treatise:

καὶ οἱ παλαιοὶ δὲ πάντες, οὐκ ἀπείρως ἔχοντες πασῶν τῶν ἁρμονιῶν, ἐνίαις ἐχρήσαντο. οὐ γὰρ ἡ ἄγνοια τῆς τοιαύτης στενοχωρίας καὶ ὀλιγοχορδίας αὐτοῖς αἰτία γεγένηται, οὐδὲ δι’ ἄγνοιαν οἱ περὶ Ὀλυμπον καὶ Τέρπανδρον καὶ οἱ ἀκολουθήσαντες τῇ τούτων προαιρέσει περιεῖλον τὴν πολυχορδίαν τε καὶ ποικιλίαν.¹²⁶

And all the ancient poets, though not without experience of all the ἁρμονίαι, only used some of them. For it was not ignorance that was responsible for such narrow melodic range and the moderate number of strings they used, nor was it through ignorance that the circles

¹²⁵ Ps.-Plut. *de Mus.* 1133b-c; for τάσιν read perhaps τάξιν, which can apply to rhythmic as well as tonal arrangement.

¹²⁶ Ps.-Plut. *de Mus.* 1137a-b.

of Olympus and Terpander, and those who followed the preference of these men, rejected a large number of strings and complexity.

- 7.62 Interestingly enough, ps.-Plutarch goes on to illustrate the ancient ὀλιγοχορδία by reference to the “three-noted” (τρίχορδα) music of Olympus’ Libation Style (cf. 3.5). In the context of these musicians knowing πᾶσαι αἱ ἁρμονίαι, such ‘gapped’ or ‘defective’ tunings emerge against a diatonic backdrop, exactly as seen in the Balkans (cf. 3.49). Likewise, the scales of Aristides Quintilianus might represent the enharmonic and polychordal development of diatony in the later fifth century and the mixing of the two genera which Aristoxenus attests. With their frequent quarter-tones they are in fact largely enharmonic in character. Yet they show sometimes more, sometimes fewer than the seven pitches which were standard throughout the Archaic period. Like the Libation Style, these pitch structures may merely have been selective against a diatonic background. Indeed, it is hard to see how they could have been preserved in written form without knowledge of diatony, since the notation system itself presupposes this method.¹²⁷
- 7.63 Without going further into the development of the σύστημα τέλειον and the nature of its antecedents, we get some idea of the important role of diatony in the fifth century, and even a distant memory of it in the Archaic period. The diatonic, an essential theoretical precursor to any more elaborate developments, appears in the earliest fragment of music theory, Philolaus fr. 6a, and was still presupposed in most of the relevant Aristotelian problems with their fundamental musical study and test questions (see further 8.0). The process of interval rotation, mentioned in connection with Eratocles, would in fact be easiest to effect with the diatonic for, as we saw in the Mesopotamian system, this method of tuning both derives from and gives rise to cyclical properties which are latent in the phenomena of resonance. Moreover, if it is correct that this process predates Eratocles, the ‘road map’ conception should represent an early stage of the cycle’s conversion to the graphic two-dimensionality of the σύστημα τέλειον. By contrast, ἡ περιφορά was demonstrable solely with the lyre, with each species or σχῆμα transformable into another in some progressive fashion.
- 7.64 Thus the evidence suggests the early existence of an integrated system of diatonic tunings, what Aristoxenus remembered as “the heptachords which they used to call the ἁρμονίαι”, and Aristophanes as “the method of tuning (ἁρμονία) handed down by our forefathers”. The modulatory relationships between these ἁρμονίαι were seen

127 See West (1992), 262.

in circular terms by the later fifth century at the latest on the traditional interpretation of Eratocles' περιφορά; but more probably Eratocles provides the *terminus ante quem* for the conception. That Sacadas modulated between three tunings, and so knew in the Archaic period some larger structural conception that could link these together, tends to confirm the suggestion that Aristoxenus' fundamental rule of diatonic "cohesion" (συνέχεια) is foreshadowed by details of language in the *Hymn to Hermes*. This does not necessarily exclude other approaches to practical and theoretical lyre music in the early Classical and Archaic periods; it may have been only one tributary to a complex music-stream (cf. 1.12, 1.22, 2.11, 2.15). Nevertheless, the diatonic component at least emerges as a self-sufficient and definite τέχνη, with the σύστημα τέλειον encrusted thereupon as being a robust and indispensable substructure. Since these were themselves required to follow diatonic structural principles, the achievement of the Aristoxenean system was to allow an intrinsically diatonic interconnection of the various microtonal genera. Thus he succeeded in protecting the heptachordal, 'Arcadian' integrity of ἀρμονική.

8.0 *Quaestio Errorum Plena: The Archaic Heptachord*

- 8.1 Shadowy as it is, the Greek evidence points to an important diatonic phase prior to the musical developments of the mid-fifth century, and this persisted into fourth-century ἀρμονική and beyond in the form of Aristoxenus' cardinal rule of συνέχεια. Two bodies of Greek evidence are now converging. The one is early, general, historical, and points forward in time. The other is and technical and late by comparison—but still the earliest such material available—and reaches back, becoming progressively more misty but still yielding valuable clues. Taken together, they provide a rough framework for understanding how the 'interval rotation' known to Eratocles could in fact be a direct descendant, albeit remolded by more than two centuries of Greek handling, of the diatonic cycle known to the Assyrians.
- 8.2 Before we can proceed to a direct comparison of the Greek and Mesopotamian textual evidence, it is first necessary to establish the identity of the seven Archaic Greek strings; for it is in the older heptachordal nomenclature that any parallel to Oriental practice will be found. The study of Greek music and theory prior to Aristoxenus is vexed by the issue of 'thetic' versus 'dynamic' nomenclature, most cogently discussed in our sources by Ptolemy.¹ The thetic values are obviously the older, referring merely to the relative positioning of the strings on a lyre; as such they are each capable of a range of pitch values. But after the development of the σύστημα τέλειον, the names acquired their secondary or 'dynamic' use (κατὰ δύναμιν),² designating the value they would have if a lyre was tuned to one of two chosen reference structures: the disjunct 'Dorian' octachord (διάζευξις) or the conjunct 'Mixolydian' heptachord (συναφή). Even here the pitch value of the names could vary with γένος, though relative to each other the strings maintained a definite sequence of pitch.

¹ Ptol. *Harm.* 2.5.

² The common translation of δύναμις as "function" is best avoided, since this inevitably implies that the δυνάμεις had some prescribed role in actual music, like the modal determinants which Winnington-Ingram sought but did not find apart from μέση; moreover, such 'functional' considerations were beyond Aristoxenus' stated limits of ἀρμονική, which did not extend to how musicians *used* the harmonic elements (*Harm.* 1). Thus, δύναμις is better understood as the 'tonal character' or 'tonal potency' of one pitch in relation to another, referring to the phenomenon of harmonic relationship between musical tones—that of ἀντιφωνία or συμφωνία for example. See further 10.30-33.

8.3 This may be represented as follows, with the diatonic values in boldface, since it is with these that the current chapter is mostly concerned:

συναφή ('Mixolydian')				διάξευξις ('Dorian')			
γένος				γένος			
Di. Ch. En.				Di. Ch. En.			
				E3	E3	E3	νήτη διεzeugμένων (N)
νήτη συνημένων (N.s)	D3	D3	D3	D3	C#	C	παρανήτη διεzeugμένων (PN)
παρανήτη συνημένων (PN.s)	C3	B2	Bb2	C3	C3	B2+	τρίτη διεzeugμένων (T)
				B2	B2	B2	παραμέση (PM)
τρίτη συνημένων (T.s)	Bb2	Bb2	A2+				< disjunctive tone >
				A2	A2	A2	μέση (M)
				G2	F#2	F2	λιχανός (L)
				F2	F2	E2+	παρυπάτη (PH)
				E2	E2	E2	ύπάτη (H)

8.4 As we have seen, the development of the σύστημα τέλειον and the standard dynamic values involved a conceptual reorientation from the cyclical and visual to a linear and diagrammatic representation of the phenomena. The Aristoxenean usage which is found in most sources will therefore tend to obscure any original sympathy between the Greek and Mesopotamian string nomenclatures. The most important step in dismantling these octachordal dynamic values is to ascertain which of the eight string names was an addition to the Archaic heptachord. A number of sources bear on this problem. It is important that none of these purports to know certainly how the transition was effected; for we cannot then expect to reconstruct this fully ourselves. Nevertheless, the material yields some important clues.

8.5 The oldest authority for the string names is Philolaus (*floruit* c. 430³) who, in the earliest testimonium which can be counted as music theory, gives a mathematical analysis of the scale—the diatonic scale:

ἀρμονίας δὲ μέγεθος ἐστὶ συλλαβὰ καὶ δι' ὀξειᾶν· τὸ δὲ δι' ὀξειᾶν μεῖζον τᾶς συλλαβᾶς ἐπογδόω. ἔστι γὰρ ἀπὸ ὑπάτας ἐπὶ μέσσαν συλλαβὰ, ἀπὸ δὲ μέσσας ἐπὶ νεάταν δι' ὀξειᾶν, ἀπὸ δὲ νεάτας ἐς τρίταν συλλαβὰ, ἀπὸ δὲ τρίτας ἐς ὑπάταν δι' ὀξειᾶν. τὸ δ' ἐν μέσῳ μέσσας καὶ τρίτας ἐπόγδοον· ἃ δὲ συλλαβὰ ἐπίτριτον, τὸ δὲ δι' ὀξειᾶν ἡμιόλιον, τὸ διὰ πασᾶν δὲ διπλόον.

3 Philolaus was born no earlier than c. 470 B.C., and possibly later: Huffman (1993), 1-6.

οὕτως ἄρμονία πέντε ἐπογδοά καὶ δυοῖν διέσεις, δι' ὀξειᾶν δὲ τρία ἐπόγδοα καὶ διέσεις, συλλαβὰ δὲ δυ' ἐπόγδοα καὶ διέσεις.⁴

The size of ἄρμονία is a fourth plus a fifth. And a fifth is greater than the fourth by the ratio 9:8. For there is a fourth from ὑπάτη to μέση, and from μέση to νήτη is a fifth, and from νήτη to τρίτη is a fourth, and from τρίτη to ὑπάτη is a fifth. And the interval between τρίτη and μέση is 9:8, and the fourth is 4:3, and the fifth is 3:2, and the octave is 2:1. Thus ἄρμονία is five intervals of 9:8 and two remainders. The fifth is three intervals of 9:8 and a remainder, and a fourth is two intervals of 9:8 and a remainder.

- 8.6 Philolaus thus outlines an octave division in which τρίτη has a pitch value—let us say B2—which in later usage was always designated by παραμέση. For, as we have just seen, the central ‘Dorian’ octave of the Aristoxenean system was arranged as follows:

H	PH	L	M	PM	T	PN	N
E2	F2	G2	A2	B2	C3	D3	E3

- 8.7 From this fragment scholars have drawn far-reaching conclusions. Because he did not use παραμέση, it is thought, Philolaus must have known only the seven ancient strings, whose names would therefore have been:

νήτη	bottom
παρανήτη	alongside bottom
τρίτη	third
μέση	middle
λιχανός	licking finger
παρυπάτη	alongside top
ὑπάτη	top

Consequently the tuning described by Philolaus, which spans an octave, must have been ‘defective’, omitting one of the other eight steps that would normally be needed

⁴ Philol. fr. 44B6a D-K, quoted by Nicom. *Ench.* 9 (252.17-253.3) and now generally accepted as authentic on the basis of its peculiar terminology, idiosyncratic placement of τρίτη, and because the ‘Pythagorean’ tuning method is presupposed by Archytas and Plato: see Burkert (1972), 386ff.; Huffman (1993), 147ff.

to fill the interval.⁵ Support for this reading has always been drawn from Nicomachus' own discussion of the passage. Yet this interpretation cannot be right, and it is necessary to reassess his true stance before considering the fragment in isolation.⁶

8.8 One of Nicomachus' chief aims in the *Enchiridium* is to show that Pythagoras introduced a new eighth string, and "made the octachord obey the consonant ratios" (τὴν ὀκτάχορδον ἀριθμοῖς συμφώνοις ὑπέταξε).⁷ This invention is certainly legendary: it is the wrong way around to suppose that the octachord known to Aristoxenus' predecessors arose for philosophical rather than musical reasons; and there is more realistic evidence to support the advent of octachords in the early fifth, rather than late sixth, century (cf. 7.15). Like so much else in the *Enchiridium* and *Excerpts*—the seven strings answering to the seven vowels (criticized already by Aristotle⁸) and seven 'stars', the catalogue of lyre-invention myths, and the erroneous account of the discovery of the consonant ratios—this tale was traditional, for Nicomachus reports the general speculation surrounding the issue, and gives an alternate account alongside his own which he concedes is "not implausible" (οὐκ ἀπιθάνως).⁹ But this fiction is easily explained if octachords had become standard within a few generations of Pythagoras, for the sage was unanimously associated with discovering the ratios of the consonances—the octave being first, and holding within itself all other harmonic relations of interest.¹⁰

8.9 But if Nicomachus believed this Pythagorean octachord to be historical, he must equally have believed that Philolaus—described as "the disciple of Pythagoras" (ὁ

⁵ Jan (1895), 81; Burkert (1972) 391ff.; Barker (1982-9) 2.37 n.34; West (1992), 219f.; Anderson (1994), 63f.; Huffman (1993), 154ff..

⁶ In a neglected article, Chailley (1968) gave a problematic but ultimately adequate demonstration that Philolaus fragment 6a and related passages from Nicomachus, the Aristotelian *Problems*, and elsewhere do not in fact envision a defective octave but relate to the transition from the seven-to eight-stringed norm. I differ from his readings in many details, but credit him with perceiving the unity of these sources.

⁷ Nicom. *Ench.* 6 (248.24f.).

⁸ Arist. *Metaph.* 14.1092b26ff.

⁹ Nicom. *Ench.* 9 (253.14ff.).

¹⁰ Cf. ps.-Plut. *de Mus.* 37: αὐτάρκεις τ' ἐνόμιζε μέχρι τοῦ διὰ πασῶν στήσαι τὴν τῆς μουσικῆς ἐπίγνωσιν ("[sc. Pythagoras] also thought that it was enough to let the study of music come to an end with the octave", trans. Barker).

Πυθαγόρου διάδοχος)¹¹—was also working with eight strings. After all, he adduces the fragment to illustrate the very numbers that the master was believed to have imposed upon the octachord. A careful reading will show that his explanation of the Philolaus fragment conforms to this historical picture. Prior to Pythagoras' transformation of the heptachord, he tells us, μέση was “distant from either extreme by a fourth” (διὰ τεσσάρων πρὸς ἀμφοτέρα ἄκρα . . . διεστῶσα).¹² Since he expressly uses the term συναφή, it is clear that this tuning is identical with the two conjunct tetrachords which form one of the two key structures in the later σύστημα τέλειον:

E2 F2 G2 A2 Bb2 C3 D3

8.10 The confusion begins with the description of how Pythagoras added the eighth string:

παρενέθηκεν ὄγδοόν τινα φθόγγον μεταξύ μέσης καὶ παραμέσης ἐνάψας καὶ ἀποστήσας ἀπὸ μὲν τῆς μέσης ὅλον τόνον, ἀπὸ δὲ τῆς παραμέσης ἡμιτόνιον· ὥστε τὴν μὲν προτέραν ἐν τῇ ἐπταχόρδῳ παραμέσῃ οὔσαν τρίτην ἔτι ἀπὸ νήτης καλεῖσθαι τε καὶ οὐδὲν ἥττον κεῖσθαι . . . παρεντεθείσης, ὀνομασθείσης δὲ ἀντὶ τῆς προτέρας παραμέσης . . .¹³

He inserted a certain eighth note [φθόγγος], joining it in between μέση and παραμέση and stationing it a wholetone from μέση and a semitone from παραμέση, so that what had previously been παραμέση in the heptachord, since it was still the third string [τρίτη] from νήτη, was so called and lay in that position no less . . . the inserted string, being named instead of the previous παραμέση . . .

A tone is said to have been “inserted” (παρενέθηκεν) between the strings μέση and παραμέση. Confusingly, these names are used in both a functional and positional sense. For in terms of function, the two stood apart by a semitone in the old heptachord, and this interval has now in effect been shifted upwards by a wholetone. Yet now the positional sense reasserts itself, for what was first given the dynamic description of new “note” (φθόγγος) now appears to be also a new string which comes between (positional) μέση and παραμέση. As a result, the old semitone (formerly A2-Bb2), now occurs between the new and as-yet-unnamed note/string “standing a wholetone from μέση” (B2), and what is still called παραμέση but has

¹¹ Nicom. *Ench.* 9 (252.13).

¹² Nicom. *Ench.* 3 (242.4f.); cf. 5 (244.14-17); 7 (249.15ff.); 11 (256.5ff.).

now lost its positional sense of “alongside μέση” (C3). The following scheme will make this clear:

H	PH	L	M	new string		PM	PN	N	
E2	F2	G2	A2	< inserted >	B2	< displaced >	C3	D3	E3
				wholetone		semitone			

- 8.11 The new note/string, being now “alongside μέση”, appropriated the original positional name παραμέση for itself, while τρίτη was introduced to designate the string that preserved the semitone relationship with the string below, and which is now—as indeed it always was—the third from the end. The result is as follows:

H	PH	L	M	PM	T	PN	N
E2	F2	G2	A2	B2	C3	D3	E3

As difficult as Nicomachus has made it, it is clear that he envisions the transformation of the old heptachord as a change from the conjunct to the disjunct structure of the σύστημα τέλειον. The whole process is, of course, suspiciously anachronistic.

- 8.12 What is important for the present purpose is Nicomachus’ exclusion of τρίτη from the seven original names. This point of view is confirmed by a passage two chapters earlier, which gives the correspondence between the heptachord and the seven stars; there too Nicomachus used παραμέση rather than τρίτη.¹⁴ Yet here he has introduced a subtle piece of evidence, for the phrase οὖσαν τρίτην ἔτι ἀπὸ νήτης (“being still third from νήτη”) naturally suggests that in the old heptachord παραμέση was sometimes conceived as, and perhaps even called, “third” (τρίτη).
- 8.13 Indeed, in one of the Nicomachean *Excerpts* we find an alternative derivation of the ancient heptachord from the celestial bodies—and this time it is τρίτη which is named, not παραμέση.¹⁵ Since the astral identifications differ from those of the *Enchiridium*, this might belong to the several passages in the *Excerpts* which derive from another hand¹⁶—although Nicomachus is here explicitly stated to be the author. Thus, either there was confusion between authorities as to whether τρίτη or παραμέση was the novel eighth string, or the two could be used indifferently.

¹³ Nicom. *Ench.* 5 (244.22-245.11).

¹⁴ Nicom. *Ench.* 3 (241.18-242.11).

¹⁵ Nicom. *Exc.* 3 (272.5f.).

¹⁶ For which see Jan (1895), 225ff.

- 8.14 In fact, the latter is shown to be the case from within the *Enchiridium* by Nicomachus' "very tortuous"¹⁷ apology on behalf of Philolaus, which must be taken step by step:

μεμνησθαι δὲ δεῖ, ὅτι τρίτην νῦν καλεῖ τὴν ἐν τῇ ἑπταχόρδῳ παραμέσῃ. πρὸ τῆς τοῦ διαzeugνύντος τόνου παρενθέσεως τῆς ἐν ὀκταχόρδῳ.¹⁸

But one must remember that here Philolaus is using τρίτη to designate the παραμέση of the heptachord prior to the insertion of the disjunctive tone in the octachord.

Here τρίτη is equated with παραμέση as it was in the ancient heptachord before the introduction of the disjunctive tone. For πρὸ τῆς τοῦ διαzeugνύντος τόνου παρενθέσεως qualifies τὴν ἐν τῇ ἑπταχόρδῳ παραμέσῃ and shows only Nicomachus' belief that Philolaus is using terminology in a way which was proper to the heptachord, not that he was working with a heptachord itself. Quite the contrary: the very fact that he bothers to mention it, as well the verbal correspondence between παρενθέσεως here and παρενέθηκεν in the earlier passage, shows that Philolaus is working with the octachord that Pythagoras invented.

- 8.15 This passage conforms, then, to the previous reports of παραμέση as belonging to the original seven strings, and the suggestion that it was somehow interchangeable with τρίτη. It is also implied that, after the introduction of the disjunctive tone, παραμέση came to mean something new. Recalling the first version, the disjunctive tone displaced παραμέση upwards by a tone to C3, whereupon this position was renamed τρίτη and the new tone was given the title παραμέση as still being next to μέση. With τὴν ἐν τῇ ἑπταχόρδῳ παραμέσῃ, Nicomachus excludes τρίτη from equaling παραμέση in either of these post-heptachordal senses. This is curious, for Philolaus obviously sees his τρίτη as having precisely the pitch value which παραμέση ultimately held in the octachord (B2), and not that which it held in the heptachord (Bb2). Hence, the two can only be equivalent in a non-dynamic sense, and this must be the positional sense within the heptachord: that is, the string in question is both "next to μέση" and "third from νήτη". Leaving aside for now the issue of historicity, it is clear that Nicomachus believed the two names to be equivalent in the heptachord, and that for some reason Philolaus has chosen to use τρίτη rather than παραμέση in the octachord.

¹⁷ Burkert (1972), 392.

8.16 Yet the “next to μέση” string which Philolaus calls τρίτη no longer has, in his usage, its ancient (i.e. Nicomachean) heptachordal pitch value (Bb2). Rather, it has taken the pitch of the disjunctive tone (B2); therefore, in Nicomachus’ mind, Philolaus is using τρίτη in reference to the disjunct octachord invented by Pythagoras. He must then understand the name παραμέση to designate one of Philolaus’ other eight strings; and after all, τρίτη has freed it from its old heptachordal function (τὴν ἐν τῇ ἑπταχόρδῳ παραμέσῃ). If the Pythagorean octachord is to be complete, this can only be C3—precisely the pitch value Nicomachus assigned to it in the first version, when the inserted disjunctive tone pushed παραμέση from Bb2 to C3. Note that, in this retelling, unlike the original version, he does not describe τρίτη, in Philolaus’ usage, as “third” from the end. This is no mere argument from silence, since the original account leads us to expect some such aitiology; and τρίτη is presented in such terms when it is given the position “next to μέση”.

8.17 In the first account, Nicomachus imagined an indeterminate period after the creation of the octachord, but before the renaming of strings, when παραμέση was not “next to μέση” and had the value C3. He did not mention any name for the new disjunctive tone/string during this transitional phase—which is probably as imaginary as the rest of the legend—but moved immediately to the time when παραμέση (C3) was renamed τρίτη, and the so-far anonymous disjunctive tone (B2) was renamed παραμέση. His rationalization of Philolaus provides the missing piece, rescuing the disjunctive tone from anonymity by assigning it the name τρίτη. Thus Nicomachus believed Philolaus to be writing after the invention of Pythagoras, but before the names came to have their final (Aristoxenean) values, and to be referring to the following octachord:

H	PH	L	M		T		PM	PN	N
E2	F2	G2	A2	< tone >	B2	<semitone>	C3	D3	E3

So far, then, there is no difficulty, other than the extremely difficult and elliptical way he presents the matter, in crediting Nicomachus with a consistent ‘before’ and ‘after’ view of the heptachord/octachord.

8.18 The following material, however, in further elaborating this imagined intermediate stage, introduces a view of the disjunction which is slightly at variance with the earlier account:

18 Nicom. *Ench.* 9 (253.3-6).

ἀπεῖχε γὰρ αὕτη τῆς παρανεάτης ἑτρημιτόνιον¹⁹ ἀσύνθετον, ἀφ' οὗ διαστήματος ἡ μὲν παρεντεθεῖσα χορδὴ τόνον ἀπέλαβε, τὸ δὲ λοιπὸν ἡμιτόνιον μεταξύ τρίτης καὶ παραμέσης ἀπελείφθη²⁰ ἐν τῇ διαζεύξει.²¹

For this [*sc.* the inserted string B2] was distant from παρανήτη by an incomposite interval of three semitones. From this interval the inserted string took back a tone, and the remaining semitone between τρίτη and παραμέση was recovered in the disjunction.

The “incomposite trihemitone” mentioned here has been taken as evidence in support of a defective octave heptachord for Philolaus. But again, Nicomachus himself can hardly be suggesting this without contradicting his own Pythagorean position, and with a little care this passage too can be made to yield a consistent reading. Chailley (1968) argued that αὕτη should refer to the closest feminine noun, τῆς τοῦ διαzeugνύντος τόνου παρενθέσεως, the disjunctive tone, rather than to the earlier feminine τρίτη. Since in Philolaus τρίτη actually has this pitch value, it may seem an unimportant distinction. But it is in fact vital, for the usual reading has τρίτη stand an “incomposite trihemitone” from παρανήτη in ancient heptachordal practice.

- 8.19 By contrast, the proposed reading has the τρημιτόνιον ἀσύνθετον come about with the introduction of the disjunction—which in the earlier account was the very development which transformed ancient heptachordal practice. Therefore Nicomachus

19 Meibom's emendation to ἑτρημιτόνιον is necessitated by ἀσύνθετον: see Burkert (1972), 392 n.31. The error is easily explained by the possibility of confusing τρι with τη in certain hands (Janko, communication), and by the word's technical nature and much less frequent occurrence than ἡμιτόνιον; there is corruption around the same word at Cleonid. 11 (201.20ff.) and 12 (204.12). But τρημιτόνιον ἀσύνθετον is paralleled at *Ench.* 12 (262.18) as well as Adrastus ap. Theo Sm. 54.23ff.; Gaud. 5 (331.14f.); Mart. Cap. 9.957; Boeth. *De inst. mus.* 1.23 (216.24ff.).

20 The emendation of ἀπελήφθη to ἀπελείφθη is convincingly supported by the verbal reminiscence of τὸ δὲ λοιπὸν ἡμιτόνιον with the usual post-Philolaan term for the semitonal remainder in the Pythagorean conception of the diatonic, the λεῖμμα (see Jan's apparatus). This interval is a passive result of tuning “through tones”, arising here between the inserted string which “took away” (ἀπέλαβε) a τόνος from the incomposite trihemitone and the τόνος which was made by disjunction (ἐν τῇ διαζεύξει). The parallelism with ἀπέλαβε easily accounts for the reading ἀπελήφθη, but this would exalt τὸ δὲ λοιπὸν ἡμιτόνιον to same level of ‘activity’ as the τόνοι, creating a false equation.

does not present a post-Philolaan development which rendered obsolete his usage of heptachordal terminology, but a pre-Philolaan development which engendered his novel usage of heptachordal terminology which had already become, in the philosopher's day, obsolete or transformed. That his innovative usage became obsolete in its turn is beside the point—or rather, this is exactly the point Nicomachus is trying to explain.

- 8.20 In the first account, the disjunction was seen as displacing παραμέση upwards by a tone to C3. Consequently, though it is not stated there, παρανήτη and νήτη would have been displaced by a like amount, and this would give παρανήτη the value of D3, three semitones from the disjunctive tone. This is just the interval given in the new version; what is mysterious is that this interval should be now be called incomposite (ἄσύνθετον); for in the first version, no distinction was made between the “insertion” of the disjunctive tone (παρενέθηκεν ὀγδοὸν τινα φθόγγον) and the “insertion” of the eighth string (ἡ παρεντεθεῖσα [sc. χορδήν]): they were one and the same. Here, however, Nicomachus separates the two, imagining a state before the new “inserted string” (ἡ παρεντεθεῖσα χορδή) but after the existence—note that he now no longer says “insertion”—of the disjunction, held now by the old heptachordal παραμέση rather than an inserted string. In this scenario, where disjunction exists but there is not yet an eighth string, there is in fact a ‘defective octave’:

H	PH	L	M		PM		PN	N
E2	F2	G2	A2	< tone >	B2	<3 semitones>	D3	E3

- 8.21 But such a state of affairs is never imputed to Philolaus himself. On the contrary, Nicomachus is only describing a passing phase—again, doubtless as imaginary as the rest of the legend—in the creation of the Pythagorean octachord. For the eighth string is now said to be inserted into the τριημιτόνιον ἄσύνθετον created by the disjunction, which lies between the until-this-very-moment-still-heptachordal παραμέση (B2) and παρανήτη (D3). If the Pythagorean octachord is to be completed as before, as it must be, this new string will have the value C3. Thus it is rightly said to “take away”—ἀπολαμβάνειν is used in other technical contexts involving the division of the pitch continuum²²—a tone from the trihemitone (i.e. the tone between itself and παρανήτη (C3-D3). There is then a semitonal remainder (τὸ δὲ λοιπὸν ἡμιτόνιον) between the new string (C3) and the old heptachordal string whose value changed from Bb2 to B2 “in the disjunction” (ἐν τῇ διαζεύξει).

²¹ Nicom. *Ench.* 9 (253.6-10).

- 8.22 Since Philolaus calls this old string τρίτη, while according to the original account παραμέση was moved upwards by a tone during the disjunction, it makes perfect sense that Nicomachus locates τὸ λοιπὸν ἡμιτόνιον “between τρίτη and παραμέση”:

H	PH	L	M	T		PM		PN	N
E2	F2	G2	A2	B2	<τὸ λοιπὸν>	C3	<τόνος>	D3	E3
ἡμιτόνιον									

That Nicomachus sees Philolaus as working with this structure prior to the renaming of the strings is proven by the sequel:

εὐλόγως οὖν ἡ πάλαι τρίτη διὰ τεσσάρων ἀπεῖχε τῆς νήτης. ὅπερ διάστημα νῦν ἀπέλαβεν ἡ παραμέση ἀντ’ ἐκείνης.²³

And so with good reason the old τρίτη was a fourth away from νήτη, which interval παραμέση now took over in that string’s place.

The reference to παραμέση taking over the function of the disjunctive tone clearly recalls the first account (παρεντεθείσης, ὀνομασθείσης δὲ ἀντὶ τῆς προτέρας παραμέσης), and dates the renaming after Philolaus (νῦν ἀπέλαβεν). If Philolaus’ τρίτη is now renamed παραμέση, it follows that the name τρίτη is free to designate the other string: the two names exchange positions exactly as in the earlier version.

- 8.23 A consistent picture also emerges from a third passage, an alternative account known to him of Pythagoras’ invention, which, to our dismay, he admits to be as credible as his own tale which seemed so authoritative:

ἄλλοι δὲ οὐκ ἀπιθάνως τὸν παρεντεθέντα φθόγγον οὐχὶ μεταξύ μέσης καὶ τρίτης ἐντεθῆναί φασιν, ἀλλὰ μεταξύ τρίτης καὶ παρανεάτης· καὶ αὐτὸν μὲν τρίτην ἀντ’ ἐκείνης ἐπικληθῆναι, τὴν δὲ πάλαι τρίτην παραμέσῃ ἐν τῇ διαζεύξει γενέσθαι.²⁴

But others say, not implausibly, that the inserted note was *not* put in between μέση and τρίτη, but between τρίτη and παρανήτη and that it was called τρίτη in place of that

²² Ptol. *Harm.* 2.2 (48.15), etc.; Aristid. *Quint.* 3.2 (97.11, 98.5ff.).

²³ Nicom. *Ench.* 9 (253.10ff.).

[sc. string, i.e. the ancient τρίτη], while the ancient τρίτη became παραμέση in the [sc. process of] disjunction.

8.24 Here again, Nicomachus uses παραμέση and τρίτη interchangeably and without the slightest twinge of conscience. For these others reject the explanation already given, saying that the inserted tone was not in fact between μέση and τρίτη. Yet when Nicomachus himself first presented this now-rejected explanation, τρίτη was never mentioned—the insertion was stated to be between μέση and παραμέση! These other scholars maintain that the insertion took place rather between τρίτη and παρανήτη. At first glance this appears to be identical with the process described in the second version of the first account, just considered—the insertion of the new string into the trihemitone between τρίτη and παρανήτη. But clearly the two cannot be equivalent since we have been promised a new explanation. Therefore, while the two are indeed alike from a strictly positional point of view, a different set of pitch values must underlie this scenario.

8.25 Nicomachus has not in fact specified any pitch values. Yet because the finished product must eventually yield Pythagoras' disjunct octachord, we may deduce that the "inserted note" (τὸν παρεντεθέντα φθόγγον) displaced παρανήτη and νήτη upwards by a wholetone:

H	PH	L	M	T	new string		PN	N
E2	F2	G2	A2	Bb2	< inserted >	C3	< displaced >	D3 E3
					τόνος		by τόνος	

and that once again there is an exchange of string names, with τρίτη being transferred to the new string—which after all is third from the end—and παραμέση taking the former position of τρίτη “alongside μέση” and acquiring the pitch value B2 it has in the new disjunct octachord (ἐν τῇ διαζεύξει):

H	PH	L	M	T>PM	new string>T	PN	N
E2	F2	G2	A2	Bb2>B2	C3	D3	E3

According to this version, Philolaus is once again imagined as postdating the Pythagorean invention, but predating the exchange of string names:

τὸν δὲ Φιλόλαον τῷ προτέρῳ ὀνόματι τὴν παραμέσιν τρίτην καλέσαι
καίτοι διὰ τεσσάρων οὔσαν ἀπὸ τῆς νήτης.²⁵

But Philolaus, they say, is calling [sc. what is now known as] παραμέση by its former
name, τρίτη, even though it was *four* away from νήτη.

- 8.26 Thus Nicomachus' three accounts are in accord, inconsistent only in how they present the insertion, whether it be viewed as a new string or the disjunctive tone. The passages are, moreover, highly elliptical, the second for instance needing the first to be understood. Most confusing of all is the interchangeable use of τρίτη and παραμέση, which is never stated explicitly. These problems are of course not unique to my reading, but have long been recognized as a constant obstacle to any interpretation. It is important that the *Enchiridium* can be reconciled on the basis of internal evidence alone. Despite his dissolute prose style, Nicomachus reveals an underlying unity of conception—as though alluding to some more cogent discussion elsewhere.
- 8.27 That such a treatment existed is seen from Boethius, who offers a lucid, succinct version of the Pythagorean octachord.²⁶ To begin with, Boethius explains carefully that in the heptachord “παραμέση, since it is third from νήτη, is also called by this same word τρίτη” (*paramese vero, quoniam tertia est a nete, eodem quoque vocabulo trite nuncupatur*).²⁷ Here, then, παραμέση is clearly regarded as the more proper term, with τρίτη an alternative of secondary status. Having first established this—a courtesy which would have made Nicomachus' own extant account much easier to follow—Boethius proceeds to relate Pythagoras' transformation of the heptachord:

²⁵ Nicom. *Ench.* 9 (253.19-254.2).

²⁶ This involves a chronological problem. As published, the lost work must postdate the *Enchiridium*, since in the latter Nicomachus promised it to his patroness at some future date: see 1 (238.6ff.); 12 (265.1ff.). But since he also refers to lessons he has given her, of which the *Enchiridium* is a mere σύνοψις (238.3) and preview of the coming textbook, it is clear that his account of the Pythagorean octachord was already formed. Perhaps his more detailed later treatment already existed in draft form. At any rate, it is more economical to suppose that Boethius has reproduced a cogent discussion from elsewhere, than that he himself has extracted a unitary account from the jumbled evidence of the *Enchiridium*.

²⁷ Boeth. *De inst. mus.* 1.20 (206.27ff.); cf. 207.8f.: *paramesen, quae etiam trite dicitur*; 207.27ff.: *in eptachordo enim est . . . mese paramese paranete nete*.

His octavam Samius Lycaon adiunxit atque inter paramesen, quae etiam trite dicitur, et paraneten nervum medium coaptavit, ut ipse tertius esset a nete, et paramese quidem vocata est sola, quae post mediam collocabatur. Trites vero nomen perdidit postea quam inter eam atque paraneten tertius a nete locatus est nervus, qui digne trites nomen exciperet.²⁸

To these [sc. seven strings in a conjunct heptachord] the Samian Lycaon [i.e. Pythagoras] adjoined an eighth, and linked together a middle string between παραμέση, which is also called τρίτη, and παρανήτη, so that it was third from νήτη, and the string which was located next to μέση was called solely παραμέση, naturally. The name of τρίτη, however, it lost after the string, which rightfully took up the name of τρίτη, was placed between it [i.e. the old παραμέση/τρίτη] and παρανήτη, third from νήτη.

- 8.28 But what historical value does the Nicomachean material actually have? The Even leaving Pythagoras aside, one may be certain that the transition from heptachord to octachord, as presented, is a myth, since it is presented so neatly as the difference between tetrachords in conjunction and disjunction, the two basic structures of the σύστημα τέλειον. We have seen that this distinction formed the basis of modulation by the middle of the fifth century, with the ‘melodic intersections’ of Ion of Chios and Eratocles (cf. 7.54-58). But since the Aristotelian *Problems*, to be considered shortly, reveal that the historical connexion between heptachord and octachord was already shrouded in mystery by the late fourth century, it seems that Aristoxenus and his Peripatetic colleagues inherited a certain amount of formal structure whose antecedents had already been obscured, and that Nicomachus has himself merely inherited a long-standing scholarly debate. In the absence of any conclusive evidence, it would quite be natural for these later scholars to extrapolate backwards from the disjunct and conjunct structures. As we shall see, this anachronistic approach is already evident in some of the Aristotelian *Problems*.
- 8.29 It is very useful, however, to have established a consistent Pythagorean program for Nicomachus, for he can no longer be used as evidence in support of a defective octave. But given that he himself admits the general uncertainty which in his day surrounded the Philolaus fragment, one might wish to dismiss his exegesis as hopelessly speculative, and so the question of a defective heptachord is once again raised. Our bafflement at Philolaus’ odd use of τρίτη comes from reading the dynamic values of the σύστημα τέλειον back to the time of Aristoxenus’ predecessors. Yet prior to the adoption of the Dorian octachord as a standard of reference, it is uncertain whether the strings had any standard pitch value at all; or whether, if they did, these were the same

as the ones that are known from Aristoxenus. After all, if Philolaus were in fact working with seven strings, he would necessarily predate the formal conception of διάζευξις upon which the usual δυνάμεις are predicated, since this is inherently octachordal. It is perfectly believable, then, that Philolaus should use τρίτη in an unfamiliar way.

- 8.30 But after all it is much more likely that Philolaus actually does have an octachord in mind. To begin with, the Pythagorean usage of ἁρμονία as “octave interval”²⁹ cannot be connected, as it has been, with those testimonia which report ἁρμονία as “seven-stringed” (see 7.15) in order to justify a defective octave tuning. This would involve circular logic; for the meaning of ἁρμονία would naturally change as the art of tuning itself evolved. We know that Aristoxenus’ predecessors in the later fifth century made octachords their standard subject of study. As he tells us, “they only spoke about octachordal enharmonic systems” (περὶ συστημάτων ὀκταχόρδων ἐναρμονίων μόνον ἔλεγον).³⁰ This enharmonic octachord structure came to be called ἁρμονία, being “the standard tuning” of the day (cf. 7.13). Similarly Plato attests ἁρμονία as a diatonic octachord.³¹ The same semantic layering is also present in the manuscript reading which I argued in the last chapter should be retained; for μόνον τῶν ἑπταχόρδων ἃ ἐκάλουν ἁρμονίας (“the heptachords which they used to call ἁρμονίαι”) verifies that ἁρμονία had an older professional meaning during the heptachord period. Likewise, the Aristotelian *Problems*, which use ἁρμονίαι of octachordal tunings, remember a time when the word designated heptachords.³²
- 8.31 Here is clear evidence then to connect the Pythagorean meaning of “octave” with an historical change in the constitution of ἁρμονία, whereby the word took on an

²⁹ Beginning with Philol. fr. 44B6a D-K; Hp. *Vict.* 1.8; Arist. fr. 47 (Rose); Thphr. fr. 717 (Fortenbaugh *et al.*) = Porph. *in Harm.* 5 (96.21ff.); Aristox. *Harm.* 36 is often adduced, though I do not accept the necessary emendation (cf. 7.12-13 and below); Plut. *Quaest. conviv.* 746a; Nicom. *Ench.* 9 (252.5f.): οἱ παλαιότατοι . . . ἁρμονίαν μὲν καλοῦντες τὴν διὰ πασῶν; Iamb. *VP* 18.82 (47.16 Deubner); Aristid. *Quint.* 1.8 (15.8ff.): παρὰ μέντοι τοῖς παλαιοῖς . . . ἐκαλεῖτο . . . τὸ δὲ διὰ πασῶν ἁρμονία; 2.12 (77.24): τοῦ διὰ πασῶν, ὃ καὶ καλοῦμεν ἁρμονίαν. Cf. Burkert (1972), 390.

³⁰ Aristox. *Harm.* 2; cf. ps.-Plut. 34.1143e-f.

³¹ Pl. *Resp.* 10.617b: ἐκ πασῶν δὲ ὀκτῶ οὐσῶν μίαν ἁρμονίαν συμφωνεῖν.

³² Ps.-Arist. *Pr.* 19.7, 19.25, 19.32, 19.44, 19.47 (all discussed below).

octachordal value.³³ With eight-stringed lyres a professional standard by the mid fifth century, knowledge of this semantic development may be safely imputed to Philolaus who was a professional contemporary, more or less, of Aristoxenus' octachordal predecessors. While he, unhelpfully for us, names only the four strings needed to demonstrate the consonant numbers, the philosopher does state the intervals which comprise ἀρμονία as five of 9:8 and two not-quite-semitone "remainders" (διέσεις). One can only understand these seven discriminations as corresponding to the intervals between eight strings, rather than abstractly articulating a continuum of tonal space for which the actual strings were 'not enough'.³⁴ As Martianus Capella wrote, "the octave contains eight notes, seven intervals" (*diapason . . . octo sonos recipit, spatia septem*).³⁵ Such a conception, if expressed with seven strings, could only be an anachronism of the octachordal period, in which case we would need to suppose that Philolaus has insisted on presenting contemporary knowledge in the antiquated heptachordal medium *pietatis causa*. Yet Plato, whose musical myths in the *Republic* and *Timaeus* are known to presuppose Philolaus, explicitly describes eight rather than seven sounding bodies—one τόνος per Siren—in *his* ἀρμονία; so too Eratosthenes looked to the octachord in his *Hermes*.³⁶ Finally, we may observe that, if Nicomachus or some earlier Pythagorean writer had conclusive evidence that Philolaus intended an octachord, it may have seemed a plausible enough deduction that he had inherited this structure from the master himself; conversely, if it was plain that Philolaus knew only seven strings, this would have conflicted with the Pythagorean tradition. We may conclude, therefore, that Philolaus' musical discussions extant at the time of Nicomachus either specified eight strings, or did not specify only seven.

- 8.32 If this is right, we are left with the conclusion that Philolaus has used παραμέση and τρίτη in precisely the opposite way that we find them in all later sources beginning with Aristoxenus. One must bear in mind that at least a century intervenes between these two authors, and another half century precedes Philolaus from the advent of

33 The explanation of Nicom. *Ench.* 9 (252.11ff.) is anomalous and doubtless fanciful: ἐξ αὐτοῦ τούτου ἀρμονία κληθεῖσα, ὅτι πρωτίστη ἐκ συμφωνιῶν συμφωνία ἡρμόσθη ("[sc. the octave] is called ἀρμονία from this very fact, that it is the first consonance to be 'harmonized' from consonances").

34 This was recognized by A. Wagener ap. Gevaert (1881), 634f.

35 Mart. Cap. 9.934; cf. Macr. *Somn. Scip.* 2.4.9: *illi autem octo cursus in quibus eadem vis est duorum, septem efficiunt distinctos intervallos sonos.*

eight-stringed lyres. Moreover, the interchangeability of τρίτη and παραμέση seems to have been a real fact of heptachordal terminology, as shown by Nicomachus' own ambivalent usage in contexts which have nothing to do with the explication of the fragment. It appears then that—of all ironies—Nicomachus, at least in this matter, knew whereof he spoke. For it is absurd to suppose that he 'planted' this synonymy elsewhere—in two independent books—merely to bolster an interpretation of the Philolaan fragment which he knew to be bogus, for the purpose of glorifying Pythagoras. After all, for the average child whose music lesson was conducted on the traditional seven-stringed lyre which persisted into later antiquity (cf. 7.15), eight names would never have been needed. In this heptachord τρίτη and παραμέση would in fact have described the string next to μέση and third from νήτη with equal precision—exactly as Boethius states—and so it need not surprise us if this doublet survived through the παιδεία. It might equally endure through Pythagorean channels, since the heptachord was so closely allied to the mythology of that cult. So it is that Nicomachus, guardian of so much other heptachordal lore, uses the two names indifferently, with no thought that it might be confusing.

- 8.33 This much, then, of Nicomachus' account may be accepted as historical. Without grasping for any specific relationship between string names and pitch structures, we may conclude that at some point in the octachordal period there arose a new usage of existing terminology which entailed the bifurcation of an earlier ambivalence. In fact, a hint of this former duality may be codified in the σύστημα τέλειον, where the strings of the upper tetrachords used the same names but were distinguished as "conjunct" and "disjunct" respectively. In this composite structure παραμέση (the disjunctive tone) falls between τρίτη συνημμένων ("τρίτη of the conjunct strings") and τρίτη διεξευγμένων ("τρίτη of the disjunct strings"):

H	PH	L	M	T.syn.	PM	T.diz.	PN	N
E2	F2	G2	A2	B2	B3	C3	D3	E3

Here too, then, is an echo of what has been deduced for Philolaus, a usage of τρίτη as between μέση and παραμέση. This parallel becomes quite viable when we regard the string names merely as a syntactical sequence divorced from specific pitch values. Again, these were not certainly fixed in their familiar values, so far as we know, before Aristoxenus.

³⁶ Pl. *Resp.* 10.617b.; cf. Plut. *De anim. procr.* 1029c-d; Eratosth. fr. 15 CA: ὀκτώ δὴ τάδε πάντα σὺν ἀρμονίῃσιν ἀρήρει. / ὀκτώ δ' ἐν σφαίρῃσι κυλίνδετο κύκλῳ

- 8.34 A number of the Aristotelian *Problems* in Book 19 are relevant to these issues. Less removed from the archaic heptachord, these contain, despite their own professed ignorance, a more historically nuanced view than that of Nicomachus. Here too we shall find, centuries earlier, implicit acknowledgement of the convertibility of παραμέση and τρίτη. Let us begin with *Problem 47*:

Διὰ τί οἱ ἀρχαῖοι ἐπταχόρδους ποιοῦντες τὰς ἀρμονίας τὴν ὑπάτην, ἀλλ' οὐ τὴν νήτην κατέλιπον; — Ἡ οὐ τὴν νήτην ἀλλὰ τὴν νῦν παραμέσην καλουμένην ἀφήρουν καὶ τὸ τονιαῖον διάστημα; ἐχρῶντο δὲ μέση τῇ ἐσχάτῃ τοῦ ἐπὶ τὸ ὀξύ πυκνοῦ· διὸ καὶ μέσην αὐτὴν προσηγόρευσαν, ὅτι ἦν τοῦ μὲν ἄνω τετραχόρδου τελευτή, τοῦ δὲ κάτω ἀρχή, καὶ μέσον εἶχε λόγον τὸν τῶν ἄκρων.³⁷

Why, when the ancients were making their heptachordal ἀρμονίαι, did they retain ὑπάτη but not νήτη. Or was it not νήτη but παραμέση—in its present day usage, i.e. the [disjunctive] wholetone interval—which they left out, and they used μέση as the last [i.e. lowest] string of the high cluster [πυκνόν], which in fact is why they called it μέση, because it was the last string of the upper tetrachord and the beginning of the lower, and held the middle position between the extremes?

- 8.35 As with Nicomachus, the proper understanding of this and the other *Problems* depends on how the string names are to be understood. Often they denote their familiar octachordal dynamic pitch values. Sometimes they take on other dynamic values as the author attempts to deduce an older heptachord. In the first part of *Problem 47*, however, when the omission of νήτη is mooted, it seems clear that the name is intended dynamically, and that there is no question that a string named νήτη did not exist with some earlier pitch value. We know from the word's phonology that νήτη was very ancient (see 9.20), but even if the Greeks of the Classical period were not aware of this, there is clear evidence that ὑπάτη and νήτη formed a familiar and inseparable pair as the limits of ἀρμονία.³⁸ Thus, the heptachord first envisioned is

λόντα.

³⁷ Ps.-Arist. *Pr.* 19.47.

³⁸ Cf. Pl. *Resp.* 4.443d: ὅρους τρεῖς ἀρμονίας ἀτεχνῶς, νεάτης τε καὶ ὑπάτης καὶ μέσης; Ps.-Arist. *Pr.* 19.44: ἐπεὶ δὲ ἐσχάτα μὲν ἐστὶν ἀρμονίας νεάτη καὶ ὑπάτη; Thrasyllus ap. Theo Sm. 48.8; Plut. *Quaest. conviv.* 745b: τῆς μὲν πρώτης Ὑπάτην.

one which is contiguous and lacking the upper octave; to this extent it recalls, or rather predicts, the contiguous ancient heptachord of Nicomachus. But note that it is not specified that it be exactly the conjunct heptachord of the σύστημα τέλειον. If it is correct that the existence of νήτη as a string is not questioned, it follows that one of the other eight strings would need to have been omitted, and that νήτη would have had some pre-octachordal dynamic value.

- 8.36 This is clarified by the alternate solution proposed next, the omission of “παραμέση in its present usage and the tone-interval”. Here it is made explicit that the modern dynamic value is intended; consequently παραμέση must have had an earlier heptachordal existence. Since no other changes are specified, this suggests at first glance a defective heptachord of the following disposition:

H	PH	L	M		PM	PN	N
E2	F2	G2	A2	B2	C3	D3	E3

Yet it is clear from the sequel that a conjunct heptachord is envisioned, for μέση is made the bottom note of the top tetrachord, and the top note of the bottom.³⁹ Since this also involves the loss of the upper octave, Jan wished to supplement the text with “Ἡ οὐ τὴν νήτην ἴσον ἀλλὰ καὶ τὴν νῦν παραμέσιν καλουμένην ἀφήρουν. But, if we are willing to tolerate a certain looseness of expression, a satisfactory reading is possible without changing the text. That is, by specifying the removal of the

τῆς δ' ἑσχάτης Νεάτην, cf. *Plat. quaest.* 1007e-1009b. These passages are discussed further in the next chapter.

- ³⁹ As Jan (1895), 107, observed, the mention of πυκνόν shows that the author probably intends not a diatonic but a chromatic or enharmonic series. This does not affect the argument, but would be important as revealing a more nuanced view of ancient practice than does Nicomachus. There is, however, some evidence that the term had a diatonic usage in relation to the semitonal interval, which is where the subdivision of the πυκνόν (in its normal sense) occurs: see *Bacch.* 33 (299.19-300.5); cf. Barker (1982-9) 2.409, n.55. The point of contact may derive from the admixture of diatonic with the other γένη. To this may be related the Pythagorean use of δίσσις to refer to a ‘semitone’ rather than the divisions of the πυκνόν in the enharmonic and chromatic genera: the certain use by Philol. fr. 44B6a D-K lends credibility to passages like *Arist. Metaph.* 4.1016b22, 14.1087b35, *APo.* 1.28.84b38f., where the semitone as πρῶτον μέτρον (*Metaph.* 4.1016b18f.) would reveal the old primacy of the diatonic; cf. Thrasyllus ap. Theo Sm. 48.20f.; Macr.

disjunctive tone, the writer understands all the strings above μέση to be lowered by this amount; and since διάζευξις is inherently a tetrachordal issue, this consequence is not difficult to accept. Indeed, this is precisely the same ellipsis, in reverse, that was found in Nicomachus when, as a result of Pythagoras' newly inserted eighth string, all the strings above μέση were displaced upwards by a tone from their former values.

8.37 Two important points emerge. First is the close connection between the Nicomachean material and this *Problem*, which provides the prototype for understanding the transition from heptachord to octachord in terms of conjunction and disjunction. Here, however, the process has not yet been associated with Pythagoras; the agent is unspecified, but it is clear that the writer is looking back to actual musical changes of the fifth century. That it is not the only possibility considered leads to the same conclusion.

8.38 Second is that a clearer methodology is established for reading the other relevant *Problems*; for it allows us to infer, alongside a central operation, collateral details which are not mentioned but only assumed. This point allows for a more precise understanding of the first heptachord to which the *Problem* alludes. Since both proposed heptachords are now seen to lack the upper octave, we may infer that the crucial distinction was rather the presence or absence of διάζευξις. Hence the first might be called a 'Dorian heptachord', that is lacking the upper octave but containing the pitch which would later be analyzed as the disjunctive tone—that is, by the octachordal predecessors of Aristoxenus, but still some generations prior to the *Problems*:

E2 F2 G2 A2 B2 C3 D3

8.39 Now, since παραμέση is accepted by the *Problem* as having had an earlier heptachordal existence, we must assume that some other string name was omitted. Here another precedent emerges for the material in Nicomachus and Boethius, for the same ambivalence between παραμέση and τρίτη emerges by comparing *Problems* 47 and 7. Described as *quaestio errorum plena* by Jan, *Problem* 7 poses the same question almost verbatim:

Διὰ τί οἱ ἀρχαῖοι ἑπταχόρδους ποιοῦντες ἀρμονίας τὴν ὑπάτην, ἀλλ' οὐ τὴν
νήτην κατέλιπον; Πότερον τοῦτο ψεῦδος — ἀμφοτέρας γὰρ κατέλιπον, τὴν δὲ

Somn. Scip. 2.1.23 *hoc semitonium Pythagorici quidem veteres* δέσιν *nominabant, sed*

τρίτην ἐξήρουν — ἢ οὐ, ἀλλ' ὅτι ἡ βαρυτέρα ἰσχεύει τὸν τῆς ὀξυτέρας
φθόγγου, ὥστε μᾶλλον ἡ ὑπάτη ἀπεδίδου τὸ ἀντίφωνον ἢ ἡ νήτη.⁴⁰

Why, when the ancients were making their heptachordal ἀρμονίαι, did they retain ὑπάτη
but not νήτη? Is this wrong—for they retained both but eschewed τρίτη?—or not, but
[they omitted νήτη] because the lower string dominates the tone of the higher string, so
that ὑπάτη gives out the tone of its octave-partner [τὸ ἀντίφωνον, i.e. νήτη] more than
νήτη does its [i.e. ὑπάτη]?

- 8.40 Again it appears, at first glance, that a defective octave is envisioned. Since in the
question νήτη is to be read dynamically (as in *Problem 47*), one assumes that the
same values should apply in the alternate proposal:

E2 F2 G2 A2 B2 C3 D3 E3

Note first that, as Jan observed,⁴¹ Πότερον τοῦτο ψεῦδος—ἀμφοτέρας γὰρ κατέλιπον,
τὴν δὲ τρίτην ἐξήρουν reads like an emendation which has been interpolated into the
Problem. This second questioner seems to have understood the *Problem* literally in
terms of string names, and not the modern dynamic values. That is, he quite
reasonably rejects the idea that either string of the familiar pair ὑπάτη-νήτη could ever
have been absent—“for they had both” (ἀμφοτέρας γὰρ κατέλιπον). He refers
rather to the dilemma of παραμέση and τρίτη—now quite familiar from Nicomachus,
Boethius, and *Problem 47*—knowing that the advent of τρίτη as a new or independent
string was related to the octachord.

- 8.41 Indeed, the formal parallels between the two *Problems* are so striking—down to the
verbal correspondence of ἀφήρουν and ἐξήρουν—that we are justified in seeking some
connection between οὐ τὴν νήτην ἀλλὰ τὴν νῦν παραμέσιν καλουμένην ἀφήρουν καὶ
τὸ τονιαῖον διάστημα in *Problem 47* and ἀμφοτέρας γὰρ κατέλιπον, τὴν δὲ τρίτην
ἐξήρουν in *Problem 7*. If we could equate the two strictly, the name τρίτη would
become synonymous with the dynamic value of τὴν νῦν παραμέσιν καλουμένην,
exactly as in Philolaus. But if the second questioner of *Problem 7* envisions only
names rather than dynamic values, the value of the parallel is more general,
acknowledging only the onomastic ambivalence of παραμέση and τρίτη, and allying
this with the transition from heptachord to octachord. In either case, a satisfactory

sequens usus sonum semitonio minorem δίεσιν constituit nominandum.

reading is possible without resorting to a defective octave interpretation.

- 8.42 The final part of *Problem 7*—that is, the answer which goes with the original question—provides a precise justification for a contiguous heptachord, without the upper octave, based on the principle of ἀντιφωνία, whereby any pitch is functionally equivalent to one an octave from itself—what Ptolemy called ἰσοδυναμῶν (“having the same δύναμις”).⁴² To have two strings so tuned is therefore musically redundant. As Isidore surmised, seven strings “fill in the whole voice” (*totam vocem implent*).⁴³ Moreover, it is understandable that νήτη should be considered less essential than ὑπάτη, since a tone contains, in its harmonic series, its own upper octave but not vice versa; in practice this pitch could be supplied by the first flageolet tone of ὑπάτη—a phenomenon which is discussed in *Problem 12*.⁴⁴ Likewise in another *Problem* we read that “it is possible to sing νήτη from ὑπάτη” (ἀπὸ τῆς ὑπάτης τὴν νεάτην δύνασθαι ᾄδειν)—which might be rendered more generally as “from a lower note one can sing its higher octave”.⁴⁵ The phenomenon is discussed at length in *Problem 18*:

ἐν δὲ τοῖς ἀντιφώνοις καὶ τὴν ἑτέραν ἐὰν ᾄδῃ, τὸ αὐτὸ ποιεῖ. ἡ γὰρ μία τρόπον τινὰ τὰς ἀμφοτέρων ἔχει φωνάς, ὥστε καὶ μιᾶς ᾄδομένης ἐν ταύτῃ τῇ συμφωνίᾳ ᾄδεται ἡ σύμφωνος, καὶ ἀμφοῖν ᾄδομέναιν ἢ τῆς μὲν ᾄδομένης τῆς δὲ αὐλουμένης ὥσπερ μίαν ἄμφω ᾄδουσιν. διὸ μόνη μελωδεῖται, ὅτι μιᾶς ἔχει χορδῆς φωνὴν τὰ ἀντίφωνα.⁴⁶

With octaves, if one sings the one note, it has the same effect [*sc.* as the other]. For somehow the one has the sounds of both, so that when one is being sung its consonant counterpart is also being sung at that consonance [*i.e.* the octave], and if both are being sung or one is sung while the other is played on the αὐλός, both sing as though they were one. Wherefore this is the only consonance which is sung [*sc.* in parallel motion], because antiphonal notes [*i.e.* at an octave] have the voice of a single string.

⁴¹ Jan (1895), 107.

⁴² Ptol. *Harm.* 2.10 (63.19); cf. 1.6 (13.4f.), 2.8 (58.21-24); cf. Scheltema (1932).

⁴³ Isid. *Etym.* 3.22.5.

⁴⁴ Cf. ps.-Arist. *Pr.* 19.12: καὶ ἐνεστίη ἐν τῷ μεγάλῳ τὸ μικρόν. καὶ τῇ διαλήψει δύο νῆται ἐν τῇ ὑπάτῃ γίνονται (“And the small is contained in the large. And by subdivision there are two νήτη-s in ὑπάτη”); for διάληψις as harmonic subdivision to produce partial tones, see Jan (1895), 84 *ad loc.*

⁴⁵ Ps.-Arist. *Pr.* 19.42.

Thus, a seven stringed lyre that spanned only a seventh would be perfectly well equipped to accompany songs of an octave or more in range—significantly, the Problem discusses ἀντιφωνία explicitly in the context of instrumental accompaniment.⁴⁷

8.43 Thus the material which concludes *Problem 7* answers, quite intelligibly, the heptachord posed in the question, and by extension the question posed by *Problem 47*, which is identical. Moreover *Problem 7*, like 47, tacitly acknowledges the existence of a Dorian heptachord, since it proposes the absence of an upper octave but discusses this entirely using the modern octachordal dynamic values. For those strings which are not mentioned explicitly, then, we must assume these same values, and the result is the modern Dorian structure without its ‘νήτη’. Conversely, the material at the end of *Problem 47*, which applies to the second heptachord it proposes, can be related to the interpolated second question of *Problem 47*. Both concluding passages refer to contiguous heptachords with no upper octave. Taken together then the two *Problems* provide a coherent picture, as though a single discussion has been split in two. As in Nicomachus, any idea of a defective octave heptachord disappears.

8.44 The issue of ἀντιφωνία and its relation to the older heptachord is addressed by three further *Problems* which, in questioning the aptness of the name ‘middle’ in a tuning of eight strings, are essentially corollaries of the foregoing. *Problem 44* contains further details which are relevant to the issue of the epicentric strings, and is discussed in the next chapter. Consider here *Problem 25*, which encapsulates the issue:

Διὰ τί μέση καλεῖται ἐν ταῖς ἀρμονίαις, τῶν δὲ ὀκτώ οὐκ ἔστι μέσον; — Ἡ ὅτι ἐπτάχορδοι ἦσαν αἱ ἀρμονίαι τὸ παλαιόν, τὰ δὲ ἑπτὰ ἔχει μέσον.⁴⁸

Why is μέση so called in the ἀρμονίαι, but there is no middle in a group of eight? Is it because the ἀρμονίαι were heptachords in the old days, and a group of seven has a middle?

⁴⁶ Ps.-Arist. *Pr.* 19.18.

⁴⁷ Cf. ps.-Arist. *Pr.* 19.39b: τελευτώσαις δ’ εἰς ταὐτὸν οὐ ταὐτὸν ποιούσαις ἐν καὶ κοινὸν τὸ ἔργον συμβαίνει γίνεσθαι, καθάπερ τοῖς ὑπὸ τὴν ᾠδὴν κρούουσιν κ.τ.λ. (“since they [*sc.* the air-impacts of two strings an octave apart] end at the same point, even if their action is not identical, their effect turns out to be one and the same, as with people who accompany song”, etc.).

⁴⁸ Ps.-Arist. *Pr.* 19.25.

- 8.45 Already in the fourth century B.C., it was a matter of curiosity that the octave was not called ἡ δι' ὀκτώ ("the consonance through eight strings") on analogy with the fourth and fifth (ἡ διὰ τεττάρων and ἡ διὰ πέντε respectively), but rather ἡ διὰ πασῶν ("the consonance through all the strings").⁴⁹ Some later authorities believed, on the strength of ἡ διὰ πασῶν for the octave, that these names derived from the octachordal period.⁵⁰ But the fact that no certain information on the matter was available in the fourth century is enough to show that these names were by then already quite old—Aristoxenus attributed them to οἱ παλαιοί⁵¹—for otherwise we might reasonably expect some memory of this coinage to have survived down to Aristoxenus, who clearly had recourse to the ideas of his octachordal predecessors.
- 8.46 Now presumably the three interval names should conform to the same semantic logic. But since "through four" and "through five" entail inclusive counting of strings, does not "though all", if there were only seven strings, imply a defective octave scale?⁵² Yet this interpretation leaves unexplained a crucial asymmetry. For there is no reason that this interval should not have been called "through seven" (ἡ δι' ἑπτὰ) on analogy with the other names; after all a 'defective' octave, presumably, would not know itself to be lacking! That ἑπτὰ was omitted implies rather that an octave was *not* in fact spanned by seven strings—at least, not in the way that the fourth and fifth were constituted.
- 8.47 This disparity is in fact some of our best evidence for ancient heptachords in the form mooted by some of the *Problems*, namely seven contiguous strings lacking an upper octave. For in such a structure the only way to count inclusively to this pitch would be to return to the first note—which, as the *Problems* and other sources tell us, was functionally identical with it—by passing "though all the strings", διὰ πασῶν. Alexander of Aphrodisias, commenting on Aristotle's ἑπτὰ δὲ χορδαὶ ἡ ἁρμονία

49 Ps.-Arist. *Pr.* 19.32: this passage is further discussed below.

50 Adrastus ap. Theo Sm. 51.10-15: τὴν διὰ πασῶν, οὕτω προσαγορευθεῖσαν ἐπειδὴ τὸ πρῶτον ἀπὸ τῆς ὀκταχόρδου λύρας ὁ πρῶτος καὶ βαρύτατος φθόγγος, καλούμενος ὑπάτη, τῷ τελευταίῳ καὶ ὀξυτάτῳ, τουτέστι τῇ νήτῃ, τὴν αὐτὴν εὐρέθη συνέχων συμφωνίαν κατ' ἀντίφωνον; cf. Iamb. *in Nic.* 120.10-13: τὸ διὰ πασῶν . . . ἐπικληθὲν καὶ αὐτὸ οὕτως, ὅτι πάσας ἐμπεριέχει τὰς τὰ ἀπλᾶ σύμφωνα ἀποτελούσας χορδὰς.

51 Aristox. *Harm.* 22.

52 Cf. Burkert (1972), 393f.

(“ἄρμονία is seven strings”)⁵³ says exactly this: “seven are the notes of the octave” (ἑπτὰ δὲ φθόγγοι τῆς διὰ πασῶν).⁵⁴ Here the use of φθόγγος to gloss χορδή is crucial for showing that a ‘defective’ octave is not meant—for every φθόγγος has a distinct δύναμις or ‘tonal significance’ (cf. 8.2, 10.30-33), whereas the δυνάμεις of notes an octave apart were considered identical for all practical purposes.⁵⁵ We have seen in the Mesopotamian tablets, too, how the upper octave was omitted in the heptatonic enumeration of CBS 10996 (6.13). An illuminating and suggestive parallel is found in Sanskrit terminology, where *saptak* (“heptad”), meaning “octave”, referred to the seven intervals of which it was comprised, whereas “from earliest times the scale is quoted as consisting of seven notes, the eighth being a repetition”.⁵⁶

- 8.48 Thus, we can find semantic unity for the three interval names only by supposing that they derive from the antique heptachordal period, and that these heptachords were contiguous. This may find confirmation in the fragment of Ion of Chios discussed in the last chapter, where δις τέσσαρα is used in the description of the ancient heptachordal music (πρὶν μὲν σ' ἑπτάτονον ψάλλον . . . πάντες). If δις τέσσαρα is in fact the correct reading, this passage can only be interpreted as a contiguous heptachord lacking a completing octave. As demonstrated in the last chapter, ἡ διὰ τεττάρων and ἡ διὰ πέντε only make consistent sense within a diatonic framework, and other details in the Ion fragment also pointed towards a systematic and cyclical diatonic conception. Once again, we glimpse the lost heptachordal θεωρία from which

⁵³ Arist. *Metaph.* 14.1093a14.

⁵⁴ Alex. Aphr. *In Metaph.* 1093a13; cf. perhaps Nicom. *Exc.* 8 (280.1ff.): ἀλλὰ πῶς φησιν ὀκτώ σφαιρῶν οὐσῶν ἑπτὰ λέγονται εἶναι οἱ φθόγγοι; (“But how can he say that the notes are said to be seven when there are eight spheres?”).

⁵⁵ See ps.-Arist. *Pr.* 19.14: ἰσότης ἐπὶ φθόγγων κ.τ.λ.; 19.16: ἀνάγκη γὰρ τὴν ἑτέραν ὁμοφωνεῖν, ὥστε δύο πρὸς μίαν φωνὴν γινόμεναι ἀφανίζουσι τὴν ἑτέραν; 19.17: ἡ αὐτὴ ἐστὶν ἅμα καὶ ἄλλη (“[sc. the octave] is simultaneously the same and different”); 19.18: τὸ αὐτὸ ποιεῖ (quoted above); 19.19; 19.39b: διὸ τῇ δυνάμει οὐκ ἴσαι εἰσὶν [sc. αἱ ἄλλαι συμφωνίαι] . . . ἐν καὶ κοινὸν τὸ ἔργον; 19.42: ὁ τῆς νεάτης φθόγγος ἀλλότριός ἐστι καὶ λήγων καὶ ἀρχόμενος, τῇ δὲ ὑπάτῃ λήγων ὁ αὐτός; Ptol. *Harm.* 1.6 (13.4f.): ἡ διὰ πασῶν συμφωνία, τῶν ποιούντων αὐτὴν φθόγγων ἀδιαφορούντων κατὰ τὴν δύναμιν ἐνός (“the consonance of the octave, whose notes [φθόγγοι], in terms of actual function, are no different from a single [sc. note]”); cf. 2.8 (58.21-24), where this is related to the cyclicity of τὸ ἡρμωσμένον, i.e. “attunement” in scales constructed according to the heptatonic principles of συνέχεια, as codified by Aristoxenus (cf. 7.26-39).

Eratocles and Aristoxenus' other immediate predecessors set out.

- 8.49 With all this in mind we may tackle the final and most difficult *Problem* that touches upon the issue:

Διὰ τί διὰ πασῶν καλεῖται, ἀλλ' οὐ κατὰ τὸν ἀριθμὸν δι' ὀκτώ, ὥσπερ καὶ διὰ τεττάρων καὶ διὰ πέντε; — Ἡ ὅτι ἑπτὰ ἦσαν αἱ χορδαὶ τὸ ἀρχαῖον. εἴτ' ἐξελὼν τὴν τρίτην Τέρπανδρος τὴν νήτην προσέθηκε καὶ ἐπὶ τούτου ἐκλήθη διὰ πασῶν, ἀλλ' οὐ δι' ὀκτώ· δι' ἑπτὰ γὰρ ἦν.⁵⁷

Why is it [*sc.* the octave] called “through all” but not “through eight” in accord with its number, like the fourth [“through four”] and the fifth [“through five”]? Is it because in the old days there were seven strings, and then Terpander took out τρίτη and added νήτη, and because of this it was called “through all”, and not “through eight”: for it was “through seven”?

- 8.50 This is the final passage which has been taken as indicating a defective octave scale, and I have translated it initially according to this interpretation. Jan rendered the structure as follows:⁵⁸

H	PH	L	M	PM/T	PN	N
E2	F2	G2	A2	C3	D3	E3

This reading does no syntactical violence to the Greek, and so is superficially intelligible. Yet it cannot be right. To begin with, this hypothetical defective octave scale would not provide the answer sought by the questioner, for as argued above, there is no reason this should not be called “through seven”. That is, if δι' ἑπτὰ γὰρ ἦν is really to explain, as γὰρ shows it must, why the seven-stringed octave was called “through all”, one must impute to Terpander the prophetic knowledge that the octave should have had eight strings rather than seven: the name would apologize for its own shortcoming.

- 8.51 One might suppose the answerer was obtuse enough not to realize this difficulty. But consider the close parallels between this and the other *Problems* considered above. Asking the same question about μέση as 44 and 25, and sharing with 7 and 47 (and

⁵⁶ See Fox-Strangways (1914), 107, 142 (quotation), *et passim*; cf. Deva (1974), 22.

⁵⁷ Ps.-Arist. *Pr.* 19.32.

⁵⁸ Jan (1895), 81.

Nicomachus) the crisis between upper octave and absence/presence of an inner string (which is either τρίτη or τὴν νῦν παραμέσῃ καλουμένην), this *Problem* serves to unite the two previous pairs with itself in a single scholarly discussion. This alliance is sealed by ἐξελῶν, which extends the verbal correspondence between ἀφῆρουν and ἐξήρουν in *Problems* 7 and 47.

- 8.52 There, as here, we saw that the verb was used to describe a feature of current octachordal usage which did not occur in the ancient heptachord. This is oddly expressed, as Jan observed, by an active verb, as though the heptachord were being created from the octachord rather than vice versa.⁵⁹ On the strength of the parallels, then, the sense should not be that Terpander subtracted something from the ancient heptachord, but that he omitted to use a string which was present at the time the question was asked. This then forces us to read of εἶτα not in its primary sense, denoting “sequence of time, without any notion of cause”, but with the secondary force of consequence, where there is commonly a sense of surprise or incongruity.⁶⁰ Thus:

Is it because in ancient times there were seven strings, and so [*sc.* as a consequence], Terpander omitted [*i.e.* did not have] τρίτη [*sc.* as it is today] and added νήτη?

Likewise in *Problems* 7 and 47, the ancients were said to have ‘removed’ τρίτη or the διάζευξις (οἱ ἀρχαῖοι . . . τὴν δὲ τρίτην ἐξήρουν) from their heptachord—all three *Problems* realizing, as Nicomachus still would, that τρίτη was not an independent string in the heptachord.

- 8.53 But how does this comport with the “addition” of νήτη? The answer lies in the pairing of ἐξελῶν and προσέθηκε, which exhibit a special relationship beyond the confines of this *Problem*. Isocrates, for example, describes a perfect speech as one in which “they were able neither to add or subtract anything from what had been said” (καὶ προσθεῖναι μὲν οὐδὲν εἶχον τοῖς εἰρημένοις οὐδ’ ἀφελεῖν).⁶¹ Thucydides uses the

⁵⁹ Jan (1895), 81: *venia autem habenda Peripatetico qui ordine rerum inverso (neque enim ex octo nervis septem factae sunt) quaerit.*

⁶⁰ See *LSJ* II; Smyth (1920), 462f. (2080, 2082).

⁶¹ Isoc. 12.264.

same words in regard to the potential modification of a treaty, suggesting a quasi-formulaic quality to the pair.⁶² Thus Aristotle cites the idea as proverbial:

ὅθεν εἰώθασιν ἐπιλέγειν τοῖς εὖ ἔχουσιν ἔργοις ὅτι οὔτε ἀφελεῖν ἔστιν οὔτε προσθεῖναι, ὥς τῆς μὲν ὑπερβολῆς καὶ τῆς ἐλλείψεως φθειρούσης τὸ εὖ, τῆς δὲ μεσότητος σωζούσης.⁶³

Whence they are accustomed to say that one can neither take away from nor add to deeds which are perfect, because excess and deficiency ruin perfection, while the mean preserves it.

- 8.54 This pursuit of the mean is the ideal “of all good craftsmen” who “work looking towards this principle” (οἱ δὴ ἀγαθοὶ τεχνῖται . . . πρὸς τοῦτο βλέποντες ἐργάζονται).⁶⁴ He avoids all excess or deficiency in the rules of his craft, and “accepts” (αἰρεῖται) the mean of not omitting (ἀφελεῖν) or adding (προσθεῖναι) anything.⁶⁵ For, as Plato says, “if we take away, or add, or transpose anything . . . it is immediately something else” (ἐάν τι ἀφέλωμεν ἢ προσθῶμεν ἢ μεταθῶμεν τι . . . εὐθύς ἕτερόν ἐστιν).⁶⁶
- 8.55 The good craftsman, who neither adds nor subtracts anything in order to preserve his τέχνη in its pure form, resonates with Terpander’s usual association with the traditional heptachord, which he established rather than transformed. Thus, when the *Problem* says that Terpander “subtracted τρίτη and added νήτη, we must, with the curious time inversion that *Problems* 7, 32, and 47 all employ, understand him as ‘undoing’ an operation which had already, in the speaker’s day, transformed the normative heptachord. In effect, then he is subtracting a τρίτη which had been added, and adding a νήτη which had been subtracted. That νήτη could have been subtracted in the creation of the octachord is a curious way to view the matter, but is decisively paralleled by the material in *Problem* 47:

Ἡ οὐ τὴν νήτην ἀλλὰ τὴν νῦν παραμέσῃν καλουμένην ἀφήρουν καὶ τὸ

⁶² Th. 5.23.6: ἦν δέ τι δοκῇ Λακεδαιμονίοις καὶ Ἀθηναίοις προσθεῖναι καὶ ἀφελεῖν περὶ τῆς συμμαχίας, ὅτι ἂν δοκῇ, εὖορκον ἀμφοτέροις εἶναι.

⁶³ Arist. *EN* 2.6.1106b9ff.

⁶⁴ Arist. *EN* 2.6.1106b13ff.; cf. 8f.: πᾶσα ἐπιστήμη . . . πρὸς τὸ μέσον βλέπουσα.

⁶⁵ Arist. *EN* 2.6.1106b5ff.: πᾶς ἐπιστήμων τὴν ὑπερβολὴν μὲν καὶ τὴν ἑλλειψιν φεύγει, τὸ δὲ μέσον ζητεῖ καὶ τοῦδ’ αἰρεῖται.

Or was it not νήτη but παραμέση—in its present day usage, i.e. the [disjunctive] whole-tone interval—which they left out?

- 8.56 Here the heptachord is described as “not omitting νήτη” (οὐ τὴν νήτην . . . ἀφήρουν), where the negating of the one verb implies the positive of its proverbial partner—exactly what we find in *Problem 32* with τὴν νήτην προσέθηκε. Thus, whereas in the octachord the “addition” of τρίτη (variably expressed as ἡ διάζευξις or ἡ νῦν καλουμένη παραμέση) occasioned the ‘removal’ of νήτη from its former position—noting now the two senses of this English word—the ‘removal’ of τρίτη brings the “addition”, i.e. ‘un-removal’, of νήτη to its previous position. In both *Problems*, the extreme string νήτη is used elliptically to stand *pars pro toto* for the others so affected; likewise, Nicomachus implied rather than enumerated the collateral movement of other strings affected by Pythagoras’ inserted tone. The antiphonal practice of omitting the upper octave, mooted in *Problem 7* and resulting from the ‘return’ to the Terpandrian norm of the contiguous heptachord, serves well enough to explain the final part of *Problem 32*: “this is why it was called ‘through all’ but not ‘through eight’: for there were *seven* strings” (ἐπὶ τοῦτο ἐκλήθη διὰ πασῶν, ἀλλ’ οὐ δι’ ὀκτώ· δι’ ἑπτὰ γὰρ ἦν).
- 8.57 In *Problem 32*, then, Terpander functions as a symbol of the traditional heptachord, and a spokesman for the ancient musicians who, ps.-Plutarch maintained, used “the Terpandrian citharody” which “endured until the time of Phrynis” (ἡ μὲν κατὰ Τέρπανδρον κιθαρῳδία καὶ μέχρι τῆς Φρύνιδος ἡλικίας . . . διετέλει) in the fifth century.⁶⁷ This accords completely with *Problems 7* and 47, which took an historical view of the heptachord-octachord transition, not associating it with some legendary figure like Pythagoras—let alone Terpander—but clearly viewing the activity of previous generations of musicians, “the ancients” generally (οἱ ἀρχαῖοι).
- 8.58 We find then a coherent, if inconclusive, Peripatetic discussion of the transition from heptachord to octachord; this is extended by other evidence to be considered later (cf. 9.36-37). But its refraction into a number of separate *Problems* altogether obscured this unity. In particular, if one were collecting testimonia about Terpander, and looked at *Problem 32* in isolation, it would be easy to form a false conclusion. This can

⁶⁶ Pl. *Cra.* 432a; cf. 418a: προστιθέντες . . . καὶ ἐξαιρουῦντες; 431c: προστιθεὶς ἢ ἀφαιρῶν.

account for a number of later sources, shown to be eccentric simply by their relatively small number, which have Terpander modify rather than establish the ancient heptachord. Thus ps.-Plutarch states that:

εἶποι τις· “ὦ τᾶν, οὐδὲν οὖν ὑπὸ τῶν ἀρχαίων προσεξεύρηται καὶ κεκαινοτόμηται;” φημί καὶ αὐτός, ὅτι προσεξεύρηται, ἀλλὰ μετὰ τοῦ σεμνοῦ καὶ πρέποντος. οἱ γὰρ ἱστορήσαντες τὰ τοιαῦτα Τερπάνδρῳ μὲν τὴν τε Δώριον νήτην προσετίθεσαν, οὐ χρησαμένων αὐτῇ τῶν ἔμπροσθεν κατὰ τὸ μέλος, καὶ τὸν Μιξολύδιον δὲ τόνον ὅλον προσεξευρῆσθαι λέγεται.⁶⁸

Someone might say, “So, my good man, was nothing additional invented or newly-forged by the ancients?” I myself admit this, that there were inventions—but in accordance with the noble and fitting. For those who research such matters attribute [προσετίθεσαν] to Terpander Dorian νήτη, his predecessors not using it in their tuning, and he is also said to have invented the whole Mixolydian τόνος.

- 8.59 The phrase Δώριον νήτην προσετίθεσαν, when compared with τὴν νήτην προσέθηκε, suggests the ultimate dependence of ps.-Plutarch’s source on *Problem* 32. But the different usage of the verb shows that the author has failed to see the significance of its original pairing with ἐξελῶν. As a result the phrase οὐ χρησαμένων αὐτῇ τῶν ἔμπροσθεν reveals that εἶτα in *Problem* 32 has been read temporally rather than consequently, and so Terpander’s ‘actions’ are seen to postdate and transform the traditional heptachord. In sources later than Aristoxenus, ‘Dorian’ refers to the central disjunct octachord that provided string names with their normal dynamic pitch values, and so “Dorian νήτη” here must refer to the octave above ὑπάτη, and so Terpander’s invention entails the creation of an octachord. But the next discovery, “the whole Mixolydian τόνος”, reveals an attempt to rationalize this spurious octachord with the “noble and fitting” in music for which Terpander traditionally stood. For the Mixolydian τόνος is, with the addition of an eighth note at the top to complete the octachord, identical with the conjunct heptachord which is mooted by *Problem* 47 and Nicomachus as the normal form of the ancient seven strings. If this absence of διάζευξις answers to ἐξελῶν τὴν τρίτην in the *Problem*—cf. τὴν νῦν παραμέσῃν καλουμένην ἀφήρουν in *Problem* 47—then we might have some further evidence for Philolaus’ use of τρίτη as B2. The irony of Terpander, the most renowned exponent of the old style of music, being linked with the crucial fifth-century development which led to its transformation, is addressed by ps.-Plutarch’s

67 Ps.-Plut. *de Mus.* 1133b-c.

opening apology that this innovation was made with respect and dignity—as though anything done by the great Terpander would be approved by conservative critics, while every other instance of πολυχорδία was unanimously condemned.

8.60 A passage in ps.-Censorinus may be accounted for in a similar way. According to this tradition Terpander, having inherited an ancient conjunct heptachord, “augmented this number by introducing the disjunction” (*hunc numerum auxisse Terpantrum adiectione diezeugmenu*).⁶⁹ Here then we have a doublet of the sequence found in Nicomachus, whereby Terpander stands to his forbears as Pythagoras did to his! These misreadings of *Problem 32* were probably supported by the problematic ‘historical’ relationship between Terpander and Orpheus, both of whom were considered originators of the seven-stringed lyre. We have seen one treatment of this ambiguity in the lyre catalogue of Nicomachus, where Terpander was allowed his traditional association with the instrument, but was rejected as the true inventor (cf. 4.31-35).

8.61 The rationalizations in ps.-Censorinus and several related sources seems to derive from a contamination of *Problem 32* (as misread) with the well known passage of Timotheus’ *Persians*:

πρῶτος ποικιλόμουσος Ὀρ-	The first devotee of complex music,
φεὺς χέλυν ἐτέκνωσεν	Orpheus, brought forth the tortoise-shell lyre
υἱὸς Καλλιόπας Πιερίας ἐπι	Calliope’s son, in Pieria.
Τέρπανδρος δ’ ἐπὶ τῷδε	And Terpander after him
κατηῦξε μοῦσαν ἐν ᾠδαῖς·	Elaborated this music in his songs;
Λέσβος δ’ Αἰολία νῆν’ Ἀν-	Aeolian Lesbos begot him to be
τίσσαι γείνατο κλεινόν·	Glorious for Antissa;
νῦν δὲ Τιμόθεος μέτροις	And now Timotheus with measures and
ῥυθμοῖς τε ἐνδεκακρουμάτοις ⁷⁰	Rhythms of eleven-stringed accompaniment

68 Ps.-Plut. *de Mus.* 1140f.

69 Ps.-Censor. *de Mus.* 6.610.14f. Timotheus is duly mentioned next, and here is yet another doublet; for he is given credit for the disjunctive tone (*paramesen*).

70 I agree with Janssen (1984) 141ff. that ἐνδεκακρουμάτοις tends to downplay the controversial issue of Timotheus’ πολυχорδία. But it cannot be completely divorced from the eleven-stringed lyre with which other sources connect him (ps.-Laconian decree ap. Boeth. *De inst. mus.* 1.1 (182.7-183.10), improved text in Wilamowitz (1903), 70f., *q.v.*

κίθαριν ἐξανατέλλει
θησαυρὸν πολύυμνον οἷ-
ξας Μουσᾶν θαλαμευτόν.⁷¹

Brings to life the ancient *cithara* [κίθαρις]
Breaking into the many-hymned
Treasure house of the Muses.

- 8.62 To counter the charges of outrageous novelty and the problems his music had faced in Sparta (cf. 2.37-38), Timotheus here aligns himself with the past masters, while at the same time promoting his reputation as an innovator.⁷² The new music antihero saw a double standard in the Spartan devotion to the memory of Terpander, who had been no less a musical pioneer in his own day. The Lesbian singer had also vaunted his *καιντομία* by urging “let us sing new hymns on the seven-stringed phorminx” (ἐπτατόνω φόρμιγγι νέους κελαθήσομεν ὕμνους). But when Timotheus brought his own “new hymns” to Sparta he is accused of “dishonoring the ancient music” (παλαιότεραν νέοις / ὕμνοις μοῦσαν ἀτιμῶ).⁷³ He does not deny that his art is novel, calling on Apollo “the promoter of the new-wrought Muse/music” (ἄέξων Μοῦσαν νεοτευχῇ).⁷⁴ Yet, he claims, he is not like the other modernists, “those who pervert the ancient music” (τοὺς δὲ μουσοπαλαιολύμας).⁷⁵
- 8.63 Conspicuous by his absence, Phrynis is tacitly included in these wreckers of the old; according to tradition, the grandfather of the avant-garde had fared similarly at the hands

for Hellenistic dating; cf. 1.20 (209.1f.); Nicom. *Exc.* 4 (274.5f.)); and its compounding with κρουμάτοις is perfectly intelligible in terms of stringed-instrument accompaniment.

⁷¹ Tim. *Pers.* fr. 15.221-233 (PMG 791). My text differs in places from that of Page and Wilamowitz: see the comments of Janssen (1984) *ad loc.*

⁷² See for example the reading of Janssen (1984), 151ff. Though his ideas suffer from an imperfect grasp of the musicological issues, his interpretation of Timotheus’ rhetorical stance is, on the whole, convincing.

⁷³ Tim. *Pers.* fr. 15.211ff. (PMG 791).

⁷⁴ Tim. *Pers.* fr. 15.202f. (PMG 791).

⁷⁵ Wilamowitz (1903), 27, paraphrases this word as τοὺς δὲ κακῶς τῇ παλαιᾷ τέχνῃ χρωμένους ποιητάς. West (1992), 361, understands as “those out-of-date music-spoilers”; so too Janssen (1984) *ad loc.* and 151. But 211f. (παλαιότεραν . . . μοῦσαν) as well as fr. 20.5 (PMG 796) (Μοῦσα παλαιά), quoted below, shows that it is not the “spoilers” who are παλαιο-, but the music itself. A sardonic pun involving the other sense is not out of the question, but the surface meaning of “those who destroy the old music” cannot be avoided, since Timotheus goes on to present himself as the worthy heir to this ancient tradition.

of the ephors.⁷⁶ That Timotheus distances himself from his predecessor's crimes is of course laughable—no doubt intentionally—for with these pious objections one may compare his own shameless boast elsewhere—"I do not sing the old . . . Away with the Old Muse" (οὐκ αἰδῶ τὰ παλαιά . . . ἀπίτω Μοῦσα παλαιά).⁷⁷ Phrynis' radical approach had in fact paved the way for Timotheus' own successes, as Aristotle recalled.⁷⁸ In a single stroke, Timotheus betrays the past master and claims his leadership of the New Music—just as, in another poem, he had exulted in his victory over the "Ionian melody-bender" at one of the contests.⁷⁹ And there is a further point to this usurpation. As we have seen, Phrynis was considered heir to the Lesbian citharodic γένος (cf. 2.12-13); Terpander and his heirs down to Pericleitus had reigned supreme at the Carneian festival in Sparta, at which Timotheus is said to have competed.⁸⁰ Timotheus closes the poem as a new Terpander, calling on Apollo—god of harmony (cf. 4.15)—to grant the city "peace blooming with good order" (εἰρήνην θάλλουσιν εὐνομίᾳ)⁸¹—clearly recalling the Lesbian celebrity's past services to Sparta, and answering the charge that he would render the city "dissonant and unharmonious" (cf. 2.40).

- 8.64 By linking Orpheus and Terpander in an evolutionary sequence, and making the former the inventor of the seven-stringed lyre, Timotheus deprives the latter of his traditional achievement. What innovation he does attribute to the Lesbian citharode is obscured by textual uncertainty. Wilamowitz read the sequence ΕΠΙΤΩΙΔΕΚΑΤΕΥΞΕ as ἐπὶ τῷ δέκα / ζευξε μοῦσαν ἐν ᾠδαῖς ("after Orpheus Terpander yoked the Muse in ten strings"), and most scholars have followed suit.⁸² The emendation is superficially attractive, because the root verb ζευγ- is otherwise prominent in the language of ἀρμονική.⁸³ But the resulting syntax is less than clear. It is difficult, if not impossible, to equate ᾠδαῖς

⁷⁶ Plut. *Apoph. lac.* 220c; other sources collected in 2.40.

⁷⁷ Tim. fr. 20 (PMG 796).

⁷⁸ Arist. *Metaph.* 2.993b15f.: εἰ μὲν γὰρ Τιμόθεος μὴ ἐγένετο, πολλὴν ἂν μελοποιίαν οὐκ εἶχομεν· εἰ δὲ μὴ Φρύνις, Τιμόθεος οὐκ ἂν ἐγένετο ("For if there were no Timotheus, we would not have a lot of music; but if there had been no Phrynis, there would be no Timotheus").

⁷⁹ Tim. fr. 26 (PMG 802).

⁸⁰ Plut. *Inst. lac.* 238c: Τιμοθέου δὲ ἀγωνιζομένου τὰ Κάρνεια; cf. Wilamowitz (1903), 68.

⁸¹ Tim. *Pers.* fr. 15.237-240 (PMG 791).

⁸² See Janssen (1984), 153ff. for the various interpretations and arguments.

with χορδαῖς.⁸⁴ Nor is there any point in specifying “ten songs”, as some would read; quite apart from being unparalleled by any other source, the musical history sketched by Timotheus clearly focuses on string configurations. West has suggested that Timotheus could have singled out from tradition the detail that Terpander added three strings to an older lyre—thus increasing the number of strings from seven to ten.⁸⁵

- 8.65 But this would then become the only source to attribute ten strings to Terpander, and would tend to undermine Timotheus’ own claims to innovation. By contrast, we have seen that, in two eccentric sources which made him proceed beyond an older heptachord, the increase entailed but a single string, and there are two further sources to be considered which conform to this. For this reason, it is preferable to adopt the reading of Aron, who makes the division ἐπὶ τῷδε / κατηῦξε μουσαν ἐν ᾠδαῖς, which may be rendered as “After Orpheus Terpander expanded the music in his songs”.⁸⁶ Parallels are found in Theon of Smyrna, who uses the related form ἐπηυξημένης to describe the polychordal music which grew from the ancient heptachord;⁸⁷ Proclus’ use of συναυξῆσαι, and ps.-Plutarch’s ἡῦξεται, in similar contexts;⁸⁸ and also *auxisse* in the ps.-Censorinus passage cited above.

83 Besides the common terms διάζευξις and διεζευγμένον considered above, there are the forms συζεῦξαι, συζυγία, and παρέζευκται, considered below and at 9.32.

84 Janssen (1984) *ad loc.* We might seek parallels in συνᾠδία, an alternate for συμφωνία, where clearly the root refers to a single voice or sound, and the compounds of -γηρυν considered in 3.7-8; compare also the τετραοίδιον attributed to Terpander by ps.-Plut. *de Mus.* 1132d with τετράγαρυν . . . αοιδάν in fr. 4.1 Gostoli, contrasting the comments of West (1971), 307f. and Anderson (1994), 62 n., with whom I agree that the comparison is strained.

85 West (1992), 362 n.22. Cf. for example Plin. *N. H.* 7.204 *septem chordis primum cecinit III ad IIII primas additis Terpander* (“Terpander first sang to seven strings, three having been added to the first four”).

86 This reading is preferred by Janssen (1984), 153ff. and Gostoli (1990), test. 46.

87 Theo Sm. 51.15-18 (the source is Adrastus): ἐπηυξημένης δὲ τῆς μουσικῆς καὶ πολυχόρδων καὶ πολυφθόγγων γεγονότων ὀργάνων κ.τ.λ.

88 Procl. *Chr.* ap. Phot. *Bibl.* 320b5-11: δοκεῖ δὲ Τέρπανδρος μὲν πρῶτος τελειῶσαι τὸν νόμον, ἠρώω μέτρῳ χρησάμενος, ἔπειτα Ἀρίων ὁ Μηθυμναῖος οὐκ ὀλίγα συναυξῆσαι, αὐτὸς καὶ ποιητῆς καὶ κιθαρῳδὸς γενόμενος. Φρύνις δὲ ὁ Μιτυληναῖος ἐκαινοτόμησεν αὐτόν· τό τε γὰρ ἑξάμετρον τῷ λελυμένῳ συνῆψε καὶ χορδαῖς τῶν ἑπτὰ πλείοσιν ἐχρήσατο. Τιμόθεος δὲ ὕστερον εἰς τὴν νῦν αὐτόν ἤγαγε τάξιν; ps.-Plut. *de Mus.* 1135d: Εἰρηκῶς κατὰ δύναμιν περὶ

- 8.66 With Terpander's string number unspecified, Timotheus' picture may still conform to the common tradition about Terpander's seven-stringed lyre. In this way the passage becomes aligned with the sequence in Nicomachus, where Terpander's heptatony was not his *invention*, but *did* inaugurate a new phase of music. Thus we can explain the tradition that Timotheus added four strings to the original seven, represented by Pausanias, Cicero, and most importantly the forged Laconian decree of Hellenistic date whose dependence on Timotheus' *Persians* is evident.⁸⁹ As ps.-Plutarch records, Timotheus, "though the lyre had had seven notes since the time of Terpander, broke it up into many".⁹⁰
- 8.67 It can equally account for the misreading in ps.-Censorinus. For where Orpheus stands for the ancient heptachord, and Terpander for some subsequent elaboration—seemingly the completion of the octave according to the misreading of *Problem 32*—the two may be linked in the same evolutionary sequence which Nicomachus associates with Pythagoras. That *Problem 32* and Timotheus have been contaminated in this way is shown by a tradition which surfaces in Plutarch, whereby Terpander, having added one string for the sake of ποικιλία, suffers at the hands of the Spartan ephors the same fate as Phrynis and Timotheus!⁹¹ Moreover, his instrument is said to have been hung up on display—exactly what happened to Timotheus in the account of Pausanias. Further duplication occurs between Phrynis and Timotheus, for both are asked on which side

τε τῆς πρώτης μουσικῆς καὶ τῶν πρώτων εὐρόντων αὐτὴν καὶ ὑπὸ τίνων κατὰ χρόνους ταῖς προσεξευρέσεσιν ἡϋξῆται. καταπαύσω τὸν λόγον ("Having spoken as I can about the first music and those who first invented it, and by whom it was increased in time by further inventions, I shall finish my account").

89 Cic. *Leg.* 2.15.39: *illa severa Lacedaemo nervos iussit quos plures quam septem haberet in Timothei fidibus incidi*; Paus. 3.12.10-11: ἐνταῦθα ἐκρέμασαν Λακεδαιμόνιοι τὴν Τιμοθέου τοῦ Μιλησίου κιθάραν, καταγνόντες ὅτι χορδαῖς ἑπτὰ ταῖς ἀρχαίαις ἐφεῦρεν ἐν τῇ κιθαρωδίᾳ τέσσαρας χορδὰς; ps.-Laconian decree ap. Boeth. *De inst. mus.* 1.1 (182.7-183.10); compare in particular Τιμόθεος . . . τὰ μ παλαιὰν μῶαν ἀτιμάσδῃ with Tim. *Pers.* fr. 15.211f. (*PMG* 791): παλαιότεραν . . . μοῦσαν ἀτιμῶ.

90 Ps.-Plut. *de Mus.* 1141c: ἑπταφθόγγου τῆς λύρας ὑπαρχούσης ἕως εἰς Τέρπανδρον τὸν Ἀντισσαῖον, διέρριψεν εἰς πλείονας φθόγγους.

91 Plut. *Inst. lac.* 17.238c-d: ἀλλὰ καὶ τὸν Τέρπανδρον, ἀρχαικώτατον καὶ ἄριστον ὄντα τῶν καθ' ἑαυτὸν κιθαρωδῶν . . . ὅμως οἱ ἐφοροὶ ἐζημίωσαν καὶ

they wish their supernumerary strings to be severed.⁹²

8.68 Plutarch, who attests this tripartite tradition about Terpander, Phrynis and Timotheus, may be taken as a *terminus ante quem* for the confusion of the sources; Athenaeus also refers to the three times the Spartans rescued music.⁹³ Thus ps.-Plutarch cites previous scholarship on the subject of Terpander's eighth string (οἱ γὰρ ιστορήσαντες τὰ τοιαῦτα); likewise Nicomachus mentions "many" and "other" discussions of Philolaus' odd terminology, which authors we may infer to have dealt also with the Pythagorean octachord.⁹⁴ The origin of the Terpendrean contamination should lie in a compilatory work which excerpted from their larger contexts testimonia about certain figures, making deductions, often false, from their juxtaposition. One possible candidate is Thrasyllus, the astrologer of Tiberius, who wrote a *Περὶ τοῦ ἑπταχόρδου* probably in the early first century A.D (cf. 7.15).⁹⁵ This work probably collected and analyzed ancient testimonia regarding the founders and transformers of the ancient heptachord. He treated Pythagorean musical mathematics and the Harmony of the Spheres,⁹⁶ but since Nicomachus disdainfully rejects his treatment of Pythagorean material, in particular the division of the monochord,⁹⁷ it may be that Thrasyllus favored the Terpendrean rather than Pythagorean invention of the octachord.

8.69 Thrasyllus is sufficiently late to have lost the more realistic historical perspective found in the fourth-century Peripatetic material; for, besides the Aristotelian *Problems*, there is fragmentary material from Aristoxenus which views the matter in a decidedly more historical light:

καὶ ἡ μιξολύδιος δὲ παθητικὴ τίς ἐστι, τραγωδίαις ἀρμόζουσα. Ἀριστόξενος δὲ φησι Σαπφῶ πρῶτην εὐρασθαι⁹⁸ τὴν μιξολυδιστί, παρ' ἧς τοὺς τραγωδοποιοὺς μαθεῖν λαβόντας γοῦν αὐτοὺς συζεῦξαι τῇ δωριστί.⁹⁹

τὴν κιθάραν αὐτοῦ προσεπαττάλευσαν φέροντες, ὅτι μίαν μόνην χορδὴν ἐνέτεινε περισσοτέραν τοῦ ποικίλου τῆς φωνῆς χάριν.

⁹² For Phrynis, Plut. *De prof. virt.* 84a; Timotheus, Plut. *Inst. lac.* 17.238c.

⁹³ Ath. 628b.

⁹⁴ Nicom. *Ench.* 9 (252.15, 253.14).

⁹⁵ Porph. *in Harm.* 5 (91.14); for Thrasyllus generally, cf. Barker (1982-9), 209f.

⁹⁶ Thrasyllus ap. Theo Sm. 85.8ff.; 93.9-11; 205.5f.

⁹⁷ Nicom. *Ench.* 11 (260.12-17).

⁹⁸ This might be amended to the perfect middle εὐρήσθαι (Janko), but the first aorist is not unparalleled: see *LSJ* s.v. εὐρίσκω.

The Mixolydian too is a rather emotional [sc. ἄρμονία], fitting to tragedies. And Aristoxenus says that Sappho first invented the Mixolydian, from whom the tragedians learned it—taking it up, that is, and yoking it together [συζευξαι] with the Dorian.

This testimonium belongs to a group which report various landmarks in the history of tuning; ps.-Plutarch has just compiled a number of these. What historical truth such reports conceal in their simplicity is a long-standing scholarly problem. They are particularly challenging for the hypothesis that the complete diatonic cycle was known since the Orientalizing period, for they seem to support the idea of a gradual evolution. One explanation may be that Aristoxenus and subsequent historians, while closer to the mid-fifth century changes than figures like Nicomachus, nevertheless did not have clear facts at hand about the state of music two or three centuries earlier; it may be, for example, that the oldest surviving piece in Mixolydian tuning that Aristoxenus could find was from the hand of Sappho. It might also be that the Mixolydian, Dorian, Phrygian etc were not always synonymous with the diatonic tunings, but were transferred to them at a later stage as being approximations. This represents a modification of the conventional view, so that diatonic tunings existed alongside, or even preceded, these other structures, rather than emerging later as systematized forms of them (cf. 1.12).

- 8.70 The material reported here by Aristoxenus is valuable for its historical contextualization of the same tonal structures which form the nucleus of the σύστημα τέλειον, and which the false legends of Terpander and Pythagoras also address. For the later Mixolydian τόνος is structurally identical with the paradigmatic conjunct structure—if expressed as an octachord—which is placed alongside the disjunct octachord as a means of illustrating the mechanism of μεταβολή. This can explain the curious use, seemingly by Aristoxenus, of the verb παραμιξολυδιάζειν to describe the music of those who, in Argos of bygone days, “first tried to use more than the seven strings” (τὸν ἐπιχειρήσαντα πρῶτον τοῖς πλείοσι τῶν ἑπτὰ χρήσασθαι).¹⁰⁰ Here πολυχорδία is clearly equated with modulation, rather than mere linear expansion of range, as though the point of an eighth string were not to provide the missing—and tonally redundant—upper octave, but to allow two distinct ἄρμονίαι to exist side-by-side, e.g.:

⁹⁹ Aristox. fr. 81 = ps.-Plut. *de Mus.* 1136c; cf. Psell. *De trag.* 5: τῶν δὲ τόνων πλεῖστον μὲν ἢ παλαιὰ [sc. τραγική] κέχρηται τῷ τε Δωρίῳ καὶ τῷ Μιξολυδίῳ κ.τ.λ.

While this 'juxta-mixolydianizing' clearly points to modulation from conjunct to disjunct as crystallized in the σύστημα τέλειον and arises as a corollary to συνέχεια, Aristoxenus does not restrict it to a single μεταβολή. For this would require only one additional string, whereas the plural τοῖς πλείοσι allows for a number of such modulations. At the same time, these are seen as conforming to the basic conjunct-disjunct relationship, the 'crossroads' of Eratocles and Ion of Chios. With παραμιξολυδιάζειν, then, we might compare the word μιξοδίη, glossed by Hesychius with τριόδος—recalling Ion's τὰς συμφωνούσας ἀρμονίας τριόδους.

- 8.71 It is interesting that Aristoxenus describes the Mixolydian as παθητική, for in the *Elementa Harmonica* he defines μεταβολή as "a certain πάθος occurring in the organization of the melody" (πάθους τινὸς συμβαίνοντος ἐν τῇ τῆς μελωδίας τάξει), while Cleonides labels the unmodulating disjunct octachord ἀπαθῆ.¹⁰¹ It is true that elsewhere other tonal structures are described as 'pathetic', while conversely πάθος describes a number of melodic 'experiences' besides modulation of species.¹⁰² But in the present case there is a special parallelism, since in both the σύστημα τέλειον and the tragedians' practice alike, μεταβολή is defined in contrast to the normative Dorian. The form συζεῦξαι, standing midway between διάzeugξις and συναφή, serves to bridge the two structures; we may compare Ptolemy's use of παρέzeugκται to describe a similar historical combining of conjunct and disjunct structures, as well as συζυγία in Nicomachus to describe the one pairing of blacksmiths' pipes which was not consonant, but rather the difference between the fourth and fifth—i.e. the same τόνος which defines the disjunctive structure.¹⁰³

- 8.72 Ps.-Plutarch goes on to adduce a tradition which is clearly related to this subject:

100 Ps.-Plut. *de Mus.* 1144f.

101 Aristox. *Harm.* 38; Cleonid. 11 (201.20); for the Mixolydian as pathetic, cf. ps.-Arist. *Pr.* 19.48 (with Jan's supplements).

102 Aristotle names the Phrygian as pathetic (*Pol.* 8.1342b1ff.), Adrastus the chromatic (ap. Theo Sm. 55.7); Bacch. 45 (302.16ff.) lists various πάθη τῆς μελωδίας.

103 Ptol. *Harm.* 2.5 (51.19f.); Nicom. *Ench.* 6 (246.5-14).

Λαμπροκλέα τὸν Ἀθηναῖον συνιδόντα, ὅτι οὐκ ἐνταῦθα ἔχει τὴν διάζευξιν ὅπου σχεδὸν ἅπαντες ᾤοντο ἀλλ' ἐπὶ τὸ ὀξύ, τοιοῦτον αὐτῆς ἀπεργάσασθαι τὸ σχῆμα οἷον τὸ ἀπὸ παραμέσης ἐπὶ ὑπάτην ὑπατῶν.¹⁰⁴

And Lamprocles the Athenian, comprehending that the disjunction was not in the place where nearly everyone thought it was, but at the top, worked out its [*sc.* the Mixolydian's] form such that it was like that from παραμέση to ὑπάτη ὑπατῶν.

Since Lamprocles gives the Mixolydian an eight step range from παραμέση to ὑπάτη ὑπατῶν (B1-B2), we may place him among Aristoxenus' predecessors who worked with octachords. The discovery relates to the transition from heptachord to octachord because in the conjunct heptachord there is no disjunctive tone; only when an eighth string is added at the octave does the διαζευξις emerge ἐπὶ τὸ ὀξύ. Interestingly enough, this is precisely the innovation which, as we saw above, was attributed to Terpander by ps.-Plutarch elsewhere in the same treatise—the establishment of the whole Mixolydian τόνος through addition of Dorian νήτη (i.e. by completion of the octave). Thus the misreading of *Problem* 32 had the effect of overwriting the tradition about Lamprocles—a good example of fact being assimilated to legend.

8.73 We may understand this as an advance against an older practice of diatonic interval rotation in that ἡ περιφορά created a succession of different tunings, while the business of the new σύστημα τέλειον was to track the same reference structure—the disjunct Dorian octachord—through its rotational permutations: a fundamental change of perspective from the purely cyclical to the cyclical expressed in linear fashion. Moreover, on the testimony of Aristoxenus discussed above, we may assume that Lamprocles was wrestling with an enharmonic version of the Mixolydian; the quarter tones and ditones may well have obscured structural affiliations which were more evident in the diatonic περιφορά. This required the plotting of the Dorian disjunction, i.e. dynamic παραμέση, throughout the previously visual and aural processual cycle. Lamprocles' discovery of the disjunctive tone thus marks the successful location of this enharmonic octachord within the rotational framework of the diatonic; Eratocles' complete enumeration of enharmonic octachords may be seen as the continuation and completion of this first phase in the transformation of the older θεωρία.

8.74 Nevertheless, the tonal reality which underlies the analysis by conjunction and disjunction is in essence no different from the modulatory process of the Symphonic Circle. Unsurprisingly, this is seen most clearly in the diatonic γένος; for in the other

genera, the conjunct and disjunct structures—showing consonant response of tetrachords at the fourth or fifth according to συνέχεια—are strikingly distinct. In the diatonic, however, the tetrachords respond simultaneously by both fourth and fifth—with the one exception of the tritone. It is this which determines whether the structure is conjunct (E2 F2 G2 A2 Bb2 C3 D3) or disjunct (e.g. E2 F2 G2 A2 B2 C3 D3). The transition from one to the other of these, in either direction, involves *de facto* the ‘clearing’ of a tritone. Whether Eratocles or Ion viewed the process in precisely this way is ultimately immaterial. Indeed, it is not necessarily the case that the Mesopotamian musicians unanimously viewed the process as it is presented in the Retuning Text, whose form may owe as much to theory as to practice.

- 8.75 I do not wish to venture more deeply into how, in terms of actual pitch values, the transition from seven strings to eight was effected. Yet a consistent and coherent picture has, rather surprisingly, emerged from the texts considered. Defective octave scales are shown to be a misapprehension of modern scholars, while contiguous ἀρμονίαι are the unanimous subject of consideration. The later sources naively reconstruct the ancient heptachord by working backwards from the σύστημα τέλειον and its conjunct-disjunct παράξευξις. But we should not altogether rule out the possibility that there was in fact some normative heptachordal structure, and that this stood in some determinate relationship to the normative Dorian octachord of Aristoxenus.
- 8.76 The most economical solution is to suppose that this was the very structure proposed by *Problem 47*, i.e. a Dorian heptachord without the completing octave (cf. 8.38). In fact, this structure might plausibly be deduced from the evidence of Aristophanes, who makes the Dorian ἀρμονία the ‘first position’ to be learned in the traditional music lesson, where seven-stringed lyres were still the norm (cf. 7.19). Yet the comic playwright was himself working, as a professional, during the octachord period, and so must have known the Dorian octachord which would become the point of reference in the σύστημα τέλειον, since by now, on any interpretation, Eratocles had already formulated its nucleus through ἡ περιφορὰ τῶν διαστημάτων. It is believable, then, that the student’s Dorian was structurally the same as the professional’s, lacking by virtue of ἀντιφωνία only the upper redundant octave which the *Problem* proposes as one innovation of the octachord. If it is correct to posit some one basic or reference tuning for the ancient heptachord, this seems much more likely than the conjunct structure of Nicomachus, and allows besides a much more economical historical explanation for the development of the σύστημα τέλειον from its heptachordal precursor. And after all, the conjunct heptachord is marked as divergent, rather than

normative, by serving as the paradigm for modulation: it was the σύστημα μεταβολικόν to the unmodulating Dorian.¹⁰⁵

- 8.77 At the same time, Aristoxenus and the *Problems*, as well as Ion and Eratocles, provide a realistic historical background which shows that the essential distinction between conjunction and disjunction was in fact intimately involved both in the heptachordy itself and the new θεωρία which supplanted it. Nicomachus explicitly saw the ancient heptachord as diatonic. The diatonic is not ruled out by most of the Aristotelian *Problems*, while acknowledgement of the πυκνόν allows for the generic modification of these prior to the octachordal period, exactly as we should expect (if this is not in fact a diatonic usage: cf. 8.36 n.). Likewise, Philolaus knew the diatonic—though now in octachordal form—but most likely treated the other genera as well.¹⁰⁶ The antiphonal perspective would in principle permit the existence of more than one contiguous heptachord which lacked its upper octave, and so the evidence converges to suggest that the ancient heptachordal ἁρμονίαι were in fact, more or less, identical with successive diatonic octave species. This is not to rule out the existence of other tonal structures, like those of Aristides Quintilianus. But equally, this motley collection of enharmonic-diatonic tunings should not be used to exclude the early existence of a coherent diatonic cycle.
- 8.78 It is always risky to speak in terms of specific tonal structures at this early period. But if one divorces the ancient string names from any consideration of pitch value, normative or otherwise, it has been possible to establish one crucial fact. For the sources are unanimously agreed that παραμέση was one of the ancient seven strings. Nicomachus' belief that τρίτη was an alternate designation for it, being third from νήτη, which only came into its own as a string name with the creation of the octachord—thus leading to much subsequent confusion—has been confirmed by the *Problems*. The same conclusion may be derived from the two testimonia regarding Simonides—Pliny's report that the poet "added the eight string" (*octavam*

¹⁰⁵ Ptol. *Harm.* 2.6 (54.7ff.): ἔοικε μέντοι τὸ τοιοῦτο σύστημα παραπεποιηθῆναι τοῖς παλαιοῖς πρὸς ἕτερον εἶδος μεταβολῆς, ὥσανεὶ μεταβολικόν τι παρ' ἐκεῖνο ἀμετάβολον ("It appears that this sort of *systema* was invented by the ancients to accommodate a different form of modulation, being treated as 'modulating' by contrast with the other one which is 'changeless'", trans. Barker); for the use of "unmodulating system" (σύστημα ἀμετάβολον) to include the inherently modulating conjunct structure, see West (1992), 223; cf. Barker (1982-9) 2.205 n.65 on Euc. *Sect. Can* 19.

Simonides addidit), and the *Suda*'s claim that he "invented the third note" (προσεξεῦρε . . . τὸν τρίτον φθόγγον).¹⁰⁷ With this we can proceed to the comparison of the Archaic heptachordal nomenclature with that of Mesopotamia.

¹⁰⁶ Philol. fr. fr. 44B6b D-K. This is rightly deduced by Burkert (1972), 398; Huffman (1993), 364ff. is too cautious on this point.

¹⁰⁷ Plin. *N.H.* 7.204; *Suda* s.v. Σιμωνίδης.

9.0 The Epicentric Strings

- 9.1 The foregoing chapters have, I hope, established the historical and technical background against which a Greco-Mesopotamian relationship may be understood. By reexamining the history of diatony in Greek sources, and dismantling the relatively late theoretical writings with their octachordal perspective, the ancient heptachordal practice inaugurated by Terpander, and pursued more or less faithfully for two centuries after him by the Lesbian school and others, has begun to resurface. A number of arguments lend credibility to the thesis that the *ἐπτάτονος φόρμιγξ* allowed the pursuit of an Orientalizing heptatony derived from contemporary—especially Assyrian—practice.
- 9.2 To move now from the probable to the proven, specific parallels need to be demonstrated between the facts recorded in the cuneiform texts and those known from Greek sources. Not that the Greeks of the eighth and seventh centuries would have been interested in written treatments of a foreign system, much less in making transcriptions of them. It is hard to imagine such texts leaving Mesopotamia for the Levant, Cyprus, and beyond, if the musical system itself could be demonstrated orally. In Terpander's time, the transition to literacy had only just begun, and even in the Classical period, Greek musical culture seems to have remained predominantly epideictic.
- 9.3 This is the first stage of removal between our sources, both a disparity of media and a geographical separation. One must also consider the amount of time which separates the extant Greek material from the Orientalizing period. Even in non-musical terms, there is virtually no trace in Greek literary sources to corroborate the Greco-Assyrian cultural contact of the eighth and seventh century may be deduced from other evidence (cf. 2.18). Not being tangible or visible, music benefits much less from the archaeological record; and a tone-system proper to the lyre family would leave no trace of any sort. Moreover, in the process of adaptation, a cultural artifact is reexpressed in a foreign language and undergoes selective reworking according to the needs and tastes of its new owners. And when, in their turn, the Hellenic theorists began to commit their musical arts to writing—yet another change of medium—they might, in addition to using traditional terms which had undergone two centuries or more of evolution, devise new labels and descriptions.
- 9.4 Yet all these hindrances can be made a virtue, since there is a tendency for vital elements to persist and the incidental to fall away; what parallels do remain may reveal

essential conceptions all the more clearly. If it is right that the Terpandean lyre is to be connected with an Orientalizing heptatonic music deriving from Mesopotamia, it follows that the data of the tablets should resonate, at some level, with the evidence for Greek music in and after the time of Terpander. In other words, with the Archaic heptachord.

- 9.5 From the start, the most promising sympathy has been between the Greek and Mesopotamian string arrangements. We recall the relevant lines of tablet U.3011 (cf. 6.3-4 and Appendix B), which show nine strings converging towards a center:

fore
 next
 third, thin
 Sumerian: fourth, small; Akkadian: Ea-creator
 fifth
 fourth of the behind
 third of the behind
 second of the behind
 the behind-one

The only detailed comparison of this configuration with the Greek strings is that advanced by Duchesne-Guillemin (1967),¹ who held that it reappeared in the eight standard string names found in Aristoxenus and later sources:

νήτη	bottom
παρανήτη	alongside bottom
τρίτη	third
παραμέση	alongside middle
μέση	middle
λιχανός	licking finger
παρυπάτη	alongside top
ὑπάτη	top

- 9.6 Wishing to correlate the Old Babylonian date of the Retuning Text with the seven- and eight-stringed Mycenaean and Minoan instruments, Duchesne-Guillemin was obliged to dismiss as false the ancient tradition of a four-stringed lyre and

¹ In this matter, Duchesne-Guillemin was followed by Picken (1975) and Lässerre (1988).

Terpander's invention of a ἑπτάτονος φόρμιγξ. Because the correspondence between the Greek and Mesopotamian nomenclatures was inexact, she posited a certain amount of 'corruption' during the (very many) centuries which intervene between the Bronze Age and the Classical period. In terms of the Old Babylonian system, then, the Greek strings were to be understood as 123[.]54λ21, where [.] stands for the missing ninth string and λιχανός, represented by λ, answers only indirectly to "third of the behind strings", but nevertheless marks its position. μέση, so important in Greek theory, thus corresponds to Ea-creator, sharing its ambiguity by having a name which calls attention to itself, without actually occupying the center of the scheme. Instead, παραμέση was entitled to this position by being "alongside μέση", just as the Mesopotamian fifth string is next to the fourth. (Note in passing that the parallel might have been expressed with equal plausibility as 12345[.]λ21 or 12345λ[.]21, with μέση answering to the central string 5.)

- 9.7 But this equation is untenable as advanced. The fatal objection is that, as we have seen, Greek stringed instruments were standardly heptachordal until the mid-fifth century (7.15). Any parallel to U.3011 must therefore be sought in the names and arrangement of seven, not eight, Greek strings. But this makes her hypothesis of a *direct* correspondence to the *nine* Old Babylonian strings even more problematic, since one would now need to suppose a still greater degree of corruption; and if one accepts the Terpandrean tradition, the hypothesis requires this distortion to take place over a mere two centuries. Finally, note that the hypothesis of corruption has the effect of divorcing the epicentric arrangement from any specific musical function. If it is right to suppose some recognizable continuity of musical practice—as Duchesne-Guillemin wished to do over a millennium or more—then this persistent core cannot have depended on the epicentric arrangement *per se*, if this was so clearly neglected. Whether the arrangement has any particular musical significance is, in fact, a crucial point, and is the subject of the final chapter.
- 9.8 With τρίτη now relegated to synonymy with, or subordination to, παραμέση, let us reassess the relationship between the Archaic Greek heptachord and the Mesopotamian strings:

νήτη
 παρανήτη
 παραμέση (τρίτη)
 μέση
 λιχανός

παρυπάτη
ύπάτη

As in the Mesopotamian system, the extremes are identified as opposites. The second and sixth strings of the Greek tuning are named in relation to the outer strings, and this too is like U.3011 with the strings progressing towards a center, μέση. Though the fifth Mesopotamian string is not called “middle”, it nevertheless occupies the central position, and in this sense corresponds closely to μέση. λιχανός, clearly anomalous, does not contribute directly to the arrangement, but nevertheless serves to mark the necessary position. παραμέση is a curious case, for here the παρά has a different force than in παρυπάτη and παρανήτη, where the primary sense “alongside” is qualified by the progressive inward positioning of the strings. Thus, while obviously “alongside μέση”, παραμέση does not advance the epicentry in the same way, countering, as it were, the direction of the sequence νήτη-παρανήτη; in this sense, λιχανός is equally “alongside μέση”.

- 9.9 Overall, then, there is a distinct epicentric arrangement albeit slightly troubled by two strings, παραμέση and λιχανός. This is already an improvement over Duchesne-Guillemin’s hypothesis, obviating the need to suppose any corruption, and with it to separate the epicentric arrangement from musical function; for the seven Archaic strings emerge as epicentric within the living nomenclature. But if the epicentry is a constant with some musical significance, a new disjunction arises which must be accounted for: its manifestation in the nine strings of Old Babylon, and the seven strings of Archaic Greece (cf. 10.6-11).
- 9.10 And yet the inexact correspondence of individual string names is equally striking, with no obvious Greek calques. Whereas U.3011 is consistent in attaching numbers to the strings, τρίτη is the only Greek string so designated. μέση has provoked frequent comparisons with Sumerian MURUB and Akkadian *qablitu*, but these refer to an interval rather than a string. Nor do we find any hint in all the Greek evidence that intervals were ever given individual names like those of Mesopotamian theory and notation.
- 9.11 Deeper analysis of the Greek names brings us back to the Terpandrean tradition; for if the hypothesis of a four-stringed lyre is correct—or, at any rate, a lyre of fewer than seven strings—one can only assume that the strings of these instruments would also have had names. Given the central status of the epic singers—often arranged into guilds, the most familiar in later times being that of the Homerids (cf. 2.36)—one

would expect this professional class to have been intimately involved with a musical revolution. Since the lyre had been, for centuries, the singers' most important tool in the preservation of traditional lore and their own ancestral trade, it is reasonable to expect that an earlier nomenclature would not have been completely effaced, but would persist somehow into a later heptatonic scheme. This provides a concrete musical parallel to the survival of fragments of epic musical terminology (5.14-19).

- 9.12 Attempts to extract from the standard seven or eight Greek strings a smaller number which were more ancient are found already in antiquity. These attempts lack plausibility, because they are found in Pythagorean musico-cosmological contexts, or try to reconcile conflicting traditions, the result being simplistic lists of progressive string-adders. Modern recognition of the problem goes back centuries (cf. 3.3), but these discussions themselves begin from the worthless ancient proposals. More promising is the approach of West (1981) who, in his attempted reconstruction of the epic singer's tuning, proposed the following as the four pre-Terpandean strings:

ὑπάτη
 λιχανός
 μέση
 νήτη

- 9.13 ὑπάτη and νήτη seemed good candidates, since the superlatives ὑπάτος and νέατος, attested in Homer, dropped from ordinary speech at an early date.² But it is λιχανός, the index or "licking" finger, that opens up the most promising line of pursuit, for, as West argued, such a name would be most appropriate in a tuning where each string corresponded to a single finger. Thus West, including μέση because of the importance given to it in later music, took it to refer originally not to a central string but to the middle finger (μέση = middle [finger] string), with an assimilation to the feminine gender of χορδή on the pattern of ὑπάτη and νήτη, rather than the masculine which would be required by δάκτυλος. The same could not happen with λιχανός, perhaps, since there is no parallel for the form *λιχανή.
- 9.14 This is clearly a valuable approach. If it is right to suppose an earlier finger-based nomenclature, this would be inherently incompatible with a seven-stringed tuning, since the Greek lyre was, as a rule, fingered with one hand only, as vase-paintings

² West (1981), 120; (1992), 220 and n.8; cf. Plut. *Plat. quaest.* 1007f: τὸ γὰρ ἄνω καὶ πρῶτον ὑπάτον οἱ παλαιοὶ προσηγόρευον κ.τ.λ.

show. But the argument may be carried further still, for in the Greek finger names we find the basis for yet another of the Archaic strings:³

μικρός	little finger
παράμεσος	next to middle finger
μέσος	middle finger
λιχανός	licking finger
ἀντίχειρ or μέγας	opposed-to-the-hand or big finger

- 9.15 Here is striking confirmation of the historical priority of παραμέση over τρίτη. παράμεσος should be a two-termination adjective; the feminine form may be explained as an assimilation to χορδή—but one then wonders why a similar form *λιχανή could not also have been coined. At any rate, here is an explanation for why λιχανός and παραμέση were anomalous in the epicentric context. The variant τρίτη now acquires new importance, correcting or clarifying, so to speak, the somewhat ambiguous παραμέση. μέση, while explicable in terms of the epicentric arrangement, also yields to the finger argument, and is deprived of any original central position on the hypothesis of a four-stringed lyre; but as one of five finger names it has an inherently centralizing value. Even here, however, we may account for the divergence of μέση from the Mesopotamian nomenclature, where the fifth string is not so named, but only so positioned. Thus μέση, παραμέση, and λιχανός share the distinction of upholding the epicentric heptachord, while at the same time having alternative values. Assuming then a four-stringed norm, three of these strings will have been:

παραμέση
μέση
λιχανός

- 9.16 What would have been the fourth string name? On the one hand, we may exclude, despite their obvious age, both ὑπάτη and νήτη, for these names take their meaning only in relation to each other, and so must be coeval. The same may be said of παρανήτη and παρυπάτη: though these are semantically dependent on ὑπάτη and νήτη rather than the reverse, the mutual intelligibility of the four names strongly urges a common origin. The tradition that there were three primal strings, νήτη, μέση, and

³ See for example Poll. 2.145: ὀνομάζονται δὲ οἱ δάκτυλοι μικρός, παράμεσος, μέσος, λιχανός, ἀντίχειρ ἢ μέγας.

ὑπάτη,⁴ emerges as a schematic outline of the inwardly-oriented conception (cf. 9.38-39). Indeed, it is significant that no tradition proposes a trichord based on the three extant finger names παραμέση-μέση-λιχανός, for it demonstrates the great antiquity of this forgotten system.

- 9.17 The ceramic evidence shows thumb and forefinger playing an important role in left-hand technique.⁵ Obviously, artistic representations are of limited value for such fine distinctions. Yet it would hardly be surprising if this were so. The thumb is strong and well-designed to cooperate with the opposed fingers—whence the name ἀντίχειρ. The little-finger, by contrast, is weakest and least independent; musicians who wish to use it to advantage must take pains to bring it up to strength. It is therefore the most likely finger to have been omitted from a four-fingered technique; and in fact the little finger is frequently omitted from the fingering technique of living folk-harp traditions. Thus a standard four-stringed Homeric φόρμιγξ might have used this nomenclature:

παραμέση
μέση
λιχανός
ἀντίχειρ

- 9.18 Yet in the end it is impossible, on the basis of the known string names, to prove the ancient tradition of a normal four-stringed lyre; one might equally imagine three- or five-stringed lyres as seen in Geometric vase-paintings (cf. 3.5). Whether these variations have any bearing on musical reality, one way or the other, is a question best avoided. Let us turn instead to the extant finger-name strings and consider their relationship to the Archaic heptachord:

‘Homeric’:		‘Terpandrean’:	
		νήτη	
		παρανήτη	
παραμέση	>	παραμέση	
μέση	>	μέση	
λιχανός	>	λιχανός	
		παρυπάτη	

⁴ D. S. 1.16.1; ps.-Censor. *de Mus.* 6.610.1f.

⁵ Roberts (1980), 44f., 53f.

- 9.19 The first point of interest is that, within the heptachordal system, the three finger-names would maintain their original contiguity, a sort of terminological fragment. If four finger names once existed, one must wonder why these three have survived, and one has been lost. Here is a productive, if accidental, point of contact between the 'Homeric' names and imported practice, for if μέση already existed as the centerpoint on the hand, it might have been pressed to service when it was necessary to distinguish a middle string. The same would have been true of λιχανός and παραμέση, which, simply by being adjacent to μέση, might now contribute to the inward arrangement; and this could account for the disappearance of a fourth finger name, which would have disrupted the symmetry. Thus these strings, which seemed to contribute somewhat indirectly to the epicentry when compared to ὑπάτη-παρυπάτη and νήτη-παρανήτη, are now seen to conform directly to the arrangement—though this now appears as the fusion of two distinct units of measurement.
- 9.20 The remaining four strings, as I have argued, must be grouped together as coeval on semantic grounds. Now the evident antiquity of ὑπάτη and νήτη plays an even more provocative role, for while they emerge as new names in relation to an older system, the time of their novelty was still very early indeed. Lasserre (1988)—who followed Duchesne-Guillemin in supposing corruption of the centralized scheme (due, in his opinion, to transmission via Phrygia or Lydia)—argued on phonological grounds that νήτη indicates a post ninth-century Ionian adoption, for νεάτη was contracted at this time to νήτη, as it appears in Homer.⁶ This does not follow, however, for if the name νεάτη had been created prior to the ninth century, nothing would have prevented it from undergoing subsequent contraction to νήτη alongside the Homeric forms which, after all, normally changed alongside the spoken language.⁷ Nor can we localize the process to Ionia, for we find the dialectal form νεάτη in both Philolaus and the Aristotelian *Problems*, suggesting that the ascendancy of Attic-Ionic musical language is a post-Classical phenomenon, perhaps due to the influence of Aristoxenus—and even then, this was not absolute.
- 9.21 What is important is that both νήτη and ὑπάτη became poetic and ceremonial in normal non-musical usage. It is not known when this happened; their attestation in Homer proves nothing, since the epic language was still living, and so made regular

6 Lasserre (1988), 77.

7 Parry (1932), 23ff.

use of contemporary diction where possible. The first Ionic prose writers are too late to be helpful. But since Terpander serves as a symbol for a larger musical movement beginning some time earlier (cf. 2.29, 3.11), this may take us within close striking distance of Homer himself, and so it is clearly possible that ὑπάτη-παρυπάτη and νήτη-παρνήτη were coinages of the Orientalizing period. Knowing more precisely when the words stopped being current in everyday language would merely let us narrow the date range between Terpander and his unknown predecessors; but such phenomena are, at any rate, gradual, and do not lend themselves to being pinpointed. That the words persisted as musical terms, despite their disappearance from regular speech, demonstrates that at least some conventions of heptachordal music from this early period had achieved classical status—the “citharody in Terpendrean style” (ἡ κατὰ Τέρπανδρον κιθαρῳδία, cf. 7.60). The words became poetic, and as string names they also occur in the context of ποίησις.

- 9.22 It appears, then, that the Archaic Greek heptachord is stratified into two distinct nomenclatures, each with its own internal logic, and that these have been harmonized in such a way as to work together in a centralized arrangement. It seems necessary to suppose a single figure who decided which older strings to keep and how to incorporate them so as to fit into a novel and different scheme. One might imagine this happening in several places in several ways, but even so the heptachordal names, as we have them, must represent the dominance of one adapter's version.⁸ It is possible that a forgotten figure, on the fringe of popularity as it would have been at first, played a key role and was then eclipsed by, for example, Terpander. Yet perhaps it is best not to struggle against the great names that were in fact vouchsafed from the past; could it not be the heptachord of Terpander himself which survived, as the ancient sources claim?
- 9.23 At any rate, it is right to suppose a pan-Hellenic musical culture even at this early date. Musical ideas were shared on occasions like the annual festival at Delos, where musicians from around the Aegean competed in the presence of Apollo.⁹ The same would have been true of the Pythian festival, where Terpander reigned supreme in the early seventh century. Such events provided a mechanism for the centralization of

⁸ Powell (1991) has likewise argued persuasively for a single adapter in the acquisition of the Phoenician alphabet, for “the same arbitrary change in a conventional system, when many—even innumerable—such changes are possible, will not occur twice, and certainly not at the same time in nearby places” (10).

⁹ Anderson (1994), 59.

musical knowledge and the evolution of an ever-more unified technical tradition. This tendency is epitomized by the famed Delian choir, whose maidens “know how to imitate the voices and castanets of all men” (πάντων δὲ ἀνθρώπων φωνὰς καὶ κρεμβαλιαστὺν / μιμεῖσθ’ ἴσασιν).¹⁰

- 9.24 The argument that an inward arrangement is merely natural or convenient (cf. 10.4) now loses much ground. The older strings, though ultimately yoked to the centralizing cause, are of a different kind, and this tends to obfuscate the original clarity of the scheme. Their survival attests, on a formal level, the continuity of native musical practice, and the importance to Greek musicians of preserving earlier tradition. At the same time, the larger centralized scheme must have been important to the new music, for otherwise why should it persevere so stubbornly against the resistance of the finger system? Thus the heptachordal nomenclature is itself syncretic, a microcosm, on a technical level, of the fusion of epic and melic found in the Homeric *Hymns* and Terpander’s dressing of Homeric ἔπη in “Orphic” μέλη.
- 9.25 If this is correct, it follows that the centralized arrangement must have been a living concern throughout the heptachordal period, becoming endangered only in the fifth century through the πολυχорδία of professionals. Moreover, given the persistence of the seven-stringed lyre in education and non-professional music, it would not be surprising to find some awareness of the approach even in considerably later sources. On the other hand, given the conceptual reorientation of the σύστημα τέλειον with its linear, octachordal framework, the extant theorists will tend to obscure this heptachordal perspective and give an impression which may be quite at variance with musical reality. Not that they failed to address real musical practice, merely that the conversion of the practical phenomena to a literary medium may have created a gulf which is difficult for us to span without “the sensation of the music itself”—all the more so since the later theoretical system was designed to accommodate *post-heptachordal innovations*.
- 9.26 Having said this, there is in fact limited but sufficient evidence—found mostly outside the theoretical sources—to demonstrate the centralized heptachord as a living concern throughout the Archaic and Classical periods. The fossilization of ὑπάτη and νήτη provides a *terminus post quem*; let us approximate it to the time of Terpander. A subsequent reaffirmation is implicit in the name τρίτη, which is of great interest as overwriting part of the ancient finger-nomenclature with one which is consciously

center-oriented. τρίτη serves this function as well as the pairs νήτη-παρανήτη and ὑπάτη-παρυπάτη; and yet, as a proper ordinal adjective, it is a terminological anomaly; conforming to neither system, it indicates a secondary development. One might reasonably expect the same innovation to have touched λιχανός; in fact, the alternative name ὑπερμέση is attested by Nicomachus in two passages to be considered below.

9.27 More concrete—and datable—evidence comes from Aristotle's *Metaphysics*:

τὰ δὲ κατὰ τάξιν (ταῦτα δ' ἐστὶν ὅσα πρὸς τι ἐν ὠρισμένον διέστηκε κατὰ
τινα λόγον, οἷον παραστάτης τριτοστάτου πρότερον καὶ παρανήτη νήτης·
ἐνθα μὲν γὰρ ὁ κορυφαῖος ἐνθα δὲ ἡ μέση ἀρχή).¹¹

Other things [*sc.* are called prior or posterior] with respect to arrangement [κατὰ τάξιν]. These are whatever things stand at intervals according to some numbering with reference to some defined point. For instance, the second-man-in-line is before the third-man-in-line, and the παρανήτη is before νήτη: in the one case the chorus-leader is the starting point, in the other μέση.

Much information may be extracted from this brief statement. Aristotle has been categorizing the ways in which things may be prior or posterior, each with respect to some starting point. When measuring time (κατὰ χρόνον), for instance, the present moment (or any other) may be used as a reference point, and of two events which happened before this point, the prior will be the one which is the more remote—a straightforward concept. The category in the present passage deals with priority “according to arrangement” (κατὰ τάξιν). Where κορυφαῖος means “chorus leader”, παραστάτης and τριτοστάτης are the chorus members standing respectively adjacent and adjacent-but-one.

9.28 Now—‘middle C’ notwithstanding—the modern view of a scale tends to be from one end to the other, its starting note either the first or last of the series, i.e. from left to right, or right to left, ascending or descending. This is also the normal theoretical view from Aristoxenus and the σύστημα τέλειον onwards. But Aristotle does not count towards νήτη from the opposite extreme, ὑπάτη, but rather from μέση, the central string, which he makes the “origin” (ἀρχή). We must assume, then, that μέση is also

11 Arist. *Metaph.* 4.1018b26ff.

the point from which to reckon the strings *παρυπάτη* and *ὑπάτη*, again counting outwards from the middle but in the opposite direction.

- 9.29 The coupling of choral positioning with lyre strings is anything but idle, for in the rectangular choruses of tragedy the *κορυφαῖος* stood in the middle of the rank facing the audience as being the strongest singer and dancer, with the others radiating outwards in each direction in descending order of ability. The application of this arrangement to circular choruses is particularly intriguing in connection with lyre-tunings, if we may press the analogy. There is also a third level of meaning in the comparison, for musical *τάξις* was involved with the metaphor of military arrangement, while there were many literal points of contact between choral and hoplite maneuvers. *παραστάτης*, for example, may equally apply to one's choral and military rank-mates. Music commonly accompanied martial actions of course,¹² but according to Athenaeus many ancient dances "simulated movements under arms" (*τάς ἐν τοῖς ὅπλοις κινήσεις ἀπομιμούμενον*).¹³ There was in fact a type of military training, common in many parts of Greece from the Archaic period or earlier, which took the form of a dance under arms.¹⁴ Sextus Empiricus reports that "those who followed the exhortations of Solon used to be deployed to lyre and *αὐλός*, making their military maneuvers in musical rhythm".¹⁵ The Athenian ephebes who served in the dramatic choruses were also undergoing their military training, and the two disciplines were fused in the shield-dance or *πυρρίχη*, in which the youths displayed to the city both their military orderliness and general fitness.¹⁶ Thus Socrates is said to have held that "best in war are those who best honor the gods in dance" (*οἱ δὲ χοροῖς κάλλιστα θεοὺς τιμῶσιν, ἄριστοι ἐν πολέμῳ*).¹⁷

12 Cf. West (1992), 29f.

13 Ath. 628e; cf. Plyb. 4.20.

14 See first Ath. 628c-632e.

15 S. E. M. 6.9-10 (164.25ff.): καὶ οἱ ταῖς Σόλωνος χρώμενοι παραινέσεσι πρὸς αὐλὸν καὶ λύραν παρετάσσοντο, ἐνρυθμον ποιούμενοι τὴν ἐνόπλιον κίνησιν; cf. 6.24 (168.3-6).

16 Ath. 628f: σχεδὸν γὰρ ὥσπερ ἐξοπλισία τις ἦν ἡ χορεία καὶ ἐπίδειξις οὐ μόνον τῆς λοιπῆς εὐταξίας, ἀλλὰ καὶ τῆς τῶν σωμάτων ἐπιμελείας ("for choral dance was very much like a kind of armed maneuver, and a demonstration not only of good order generally but of care for bodily fitness"). See the brilliant discussion by Winkler (1989), 48-58; cf. Anderson (1966), 254 n.75.

17 Ath. 628f.

9.30 The connection of this imagery with the musical begins with the notion of each string as a speaking or singing voice, implicit in terms like σύμφωνος and συνῳδός. The strings were often likened to a group of Muses, Sirens, or heavenly bodies (cf. 4.26), and the equation with a chorus is made implicitly by a poem from the *Palatine Anthology*, where the Chorus of Celestial Stars (οὐρανίων χορὸν ἄστρον) inevitably calls to mind the lyre.¹⁸ Now, in both choral and military formation a rank was called ζυγόν, a file στοῖχος;¹⁹ hence the *Suda* defines one's rankmates, παραστάται, as οἱ ὁμόζυγοι. Since strings were also ranked along the ζυγόν or yoke of the lyre, this gives special point to terms like συζεῦξαι, διάζευξις, and συζυγία, considered in the last chapter (8.71). Indeed, Ptolemy's description of the conjunct and disjunct structures having once been "yoked alongside" (παρέζευκται) might refer to their literal adjacency on the lyre's crossbar:²⁰

E2 F2 G2 A2 Bb2 B2 C3 D3

Such a structure conforms to the idea that πολυχорδία enabled the combination of ἁρμονίαι rather than mere extension of 'range' (cf. 8.74).

9.31 Aristotle uses the lyre strings as an example of arrangement κατὰ τάξιν—normal Peripatetic language, but with particular relevance here since τάττεσθαι ("to station") and its relations have common military connotations. Τάξις itself can denote "position or place in the line of battle", or be synonymous with ζυγόν in the sense of "rank of a battle line".²¹ But τάξις had long been the normal term for the specific

¹⁸ *Anth. Pal.* 9.504.8f. (Anon.): ἁρμονίην πάσῃσι Πολύμνια δῶκεν ἀοιδᾷς / Οὐρανίη πόλον εὔρε καὶ οὐρανίων χορὸν ἄστρον; cf. also *Pl. Grg.* 482b-c: καίτοι ἔγωγε οἶμαι . . . καὶ τὴν λύραν μοι κρεῖττον εἶναι ἀνάρμοστον τε καὶ διαφωνεῖν, καὶ χορὸν ᾧ χορηγοίην . . . μᾶλλον ἢ ἓνα ὄντα ἐμὲ ἐμαυτῶ ἀσύμφωνον εἶναι.

¹⁹ *Poll.* 4.108: μέρη δὲ χοροῦ στοῖχος καὶ ζυγόν; 4.108-9 for various choral configurations. See further the discussion and sources in Pickard-Cambridge (1968), 239-242.

²⁰ *Ptol. Harm.* 2.5 (19f.).

²¹ See *LSJ* s.v. τάξις I.3 and 5.

tuning of both a single string or group of strings,²² corresponding precisely to the military meanings cited. Aristotle's use of ἀρχή, with its military overtones, serves to bind the three images together, and both μέση and the κορυφαῖος could be referred to as the ἡγεμῶν or "leader".²³

- 9.32 As we have seen, the τάξις of soldiers could be described by an application of harmonic language, while for choral dance we may adduce the very ancient word βητάρμονες or "step-joiners" (cf. 4.22). Like ὁμόζυγοι, Alcman used ὁμοστοίχους to describe "girls choral-dancing in formation".²⁴ This too is relevant to musical conceptions like 'harmonic elements' (cf. 7.30), as well as the common association of letters (στοιχεῖα) with musical notes—most purely expressed in the system of Greek notation itself. Such side-by-side deployment created a series of kindred elements, whence the close linguistic involvement, attested already in epic, of the harmonic with 'the continuous'.²⁵ Thus συνέχεια in Aristoxenus, which sought diatonic cohesion in polychordal and modulatory compositions, represents the abstraction of pitch structures which were once found in adjacent strings on the lyre's yoke, and which, as a series, could be 'continuously' converted from one to the other (cf. 7.44-46). In the

²² E.g. Ion of Chios fr. 32 (West): ἐνδεκάχορδε λύρα, δεκαβάμονα τάξιν ἔχουσα; Hp. Vict. 1.18: ἀρμονίης συντάξεις; Aristox. Harm. 38: ἐν τῇ τῆς μελωδίας τάξει, 42: τῆς τοῦ ἡρμοσμένου τάξεως, *et passim*; ps.-Arist. Pr. 19.27: ἐν τῇ τῶν φθόγγων τάξει, cf. 19.36; Cleonid. 9 (195.6); [14] (207.11f.): τάξις φθόγγου; Nicom. Ench. 11 (258.11), etc.; Ptol. Harm. 2.6 (55.6), etc.; Aristid. Quint. 1.8 (14.28), etc.; Bacch. 26 (298.19); Gaud. 6 (331.25), etc.; Suda s.v. νόμος: ὁ κιθαρῳδικὸς τρόπος τῆς μελωδίας, ἀρμονίαν ἔχων τακτὴν; duplicated by Phot. Lex. s.v. νόμος.

²³ Ps.-Arist. Pr. 19.22 of the chorus leader; 19.33 of μέση: ἡ γὰρ μέση καὶ ἡγεμῶν (καὶ) ὀξύτάτη τοῦ τετραχόρδου; Ps.-Plut. de Mus. 1135a.

²⁴ Alcman. 33 PMGF: καὶ Ἀλκμάν ὁμοστοίχους ἐκάλεσε τὰς ἐν τάξει χορευούσας παρθένους.

²⁵ In addition to Hom. Il. 16.211-217 (cited in 4.24), cf. Od. 2.342: [sc. πίθοι] ἐξείης ποτὶ τοῖχον ἀρηρότες, of jars "continuously joined along a wall"; the same idea is implicit in city walls which are articulated by gates or towers, Hom. Il. 15.737: πόλις πύργοις ἀραρυῖα ("A city 'fitted' with towers"); Od. 7.44f. of the Phaeacian city: τείχεα μακρὰ / ὑψηλά, σκολόπεσσιν ἀρηρότα, θαῦμα ἰδέσθαι ("Walls, great and high, 'joined' with look-out posts, a wonder to see"); cf. Il. 4.133f. and 14.181: ζώνη ἑκατὸν θυσάνοις ἀραρυῖη, of a belt 'fitted' with tassels; Aristid. Quint. 3.6 (102.2f.): πάντα γὰρ γίνεσθαι διὰ τῆς εἰς ἐν ἀρμονίας συνεχόμενα ("For all things are 'held together' through the joining [ἀρμονία] into one").

same way, the ancient interval names, which once referred quite literally to typical string spacing, were retained when these were abstracted into absolute sonic distances.²⁶ Once again, the evidence points to contiguous scales as typical of the ancient heptachordal art.

- 9.33 It is clear, then, that Aristotle intends his examples to be mutually illuminating. They are further bound by the verbal parallel between παραστάτης and the use of παρα-compounds in the string names. And yet, when this parallel is pressed, some curious and valuable disparities emerge. On the analogy of κορυφαῖος-παραστάτης-τριτοστάτης, one expects the ἀρχή from which παρανήτη is reckoned to be νήτη, and the sequence νήτη-παρανήτη-τρίτη in the octachordal terminology (or using τρίτη as the alternative heptachordal name) could have provided an exact verbal parallel for all three members of the list. And yet, though the issue of priority is relative, Aristotle stated earlier in the same passage that, if in a given genus of thing there is some natural starting point, counting will begin thence. This shows that μέση has not been chosen at random to be ἀρχή, but played the normal role in reckoning.
- 9.34 In this case, however, one must still wonder why Aristotle gives the discontiguous sequence μέση-παρανήτη-νήτη rather than μέση-παραμέση-τρίτη in the octachord, which would be both contiguous like the choral example, and would also provide a precise verbal parallel. But the choral example shows that the ordering applies in both directions, so that answering to μέση-παραμέση-τρίτη would be μέση-λιχανός-παρυπάτη. Since the string names and positions were well known, such a sequence would illustrate the point quite satisfactorily. Yet the names themselves do not evince an outward sequence as clearly as τριτοστάτης-παραστάτης-κορυφαῖος-

²⁶ Cf. Adrastus ap. Theo Sm. 51.4-20: τῶν δὲ κατὰ τὸ ἐξῆς ἡρμοσμένων φθόγγων πρῶτοι μὲν οἱ τέταρτοι τάξει συμφωνοῦσι πρὸς ἀλλήλους κ.τ.λ. . . . ἐπηυξημένης δὲ τῆς μουσικῆς καὶ πολυχόρδων καὶ πολυφθόγγων γεγονότων ὀργάνων τῷ προσληφθῆναι καὶ ἐπὶ τὸ βαρὺ καὶ ἐπὶ τὸ ὀξύ τοῖς προϋπάρχουσιν ὀκτὼ φθόγγοις ἄλλους πλείονας, ὅμως τῶν πρῶτων συμφωνιῶν αἱ προσηγορίαι φυλάττονται, διὰ τεσσάρων, διὰ πέντε, διὰ πασῶν. ("Of notes which are tuned [lit. 'harmonized'] in a 'continuous' series, first those which are fourth from each other in the arrangement (τάξει) are concordant [etc., on the fifth and octave] . . . but with the expansion of music and instruments which had become polychordal and many-noted through taking many other notes on the bottom, and on the top, in addition to the preexisting eight, still the names of the first consonances were protected—'through four', 'through five', 'through all'".)

παραστάτης-τριτοστάτης. Only the strings explicitly mentioned (νήτη and παρανήτη), or logically implied through lexical symmetry (ὑπάτη and παρυπάτη), offer the parallel to both relative positioning and verbal illustration: ὑπάτη-παρυπάτη-μέση-παρανήτη-νήτη.

- 9.35 Given the confusion and Peripatetic debate engendered by the addition of τρίτη as an independent string and its coexistence with παραμέση, we may suppose that Aristotle avoided citing these strings for the sake of clarity. This would be especially important if it is correct to posit for Philolaus a transitional period in which the relative positions of these names were not fixed (cf. 8.32). But this conceals a more vital point. Aristotle, in omitting any mention of τρίτη, intentionally referred his example to the Archaic heptachordal τάξις. It was here that the centralized structure—needed to parallel the choral example—was operative; the octachord, by contrast, with its bifurcation of τρίτη-παραμέση, had overwritten this.
- 9.36 In this light, consider further the use of προσθεῖναι and ἀφελεῖν in the Aristotelian *Problems* discussed in the last chapter. The pair of terms, as we saw, was proverbial to mark the deviation from a definite entity, the preservation of which was seen as the pursuit of an ideal mean. Thus, in *Problem* 19.32, the theoretical undoing of octachordal “additions and subtractions” was described as a return to the ‘moderate’ position of the Terpandrian heptachord. Given that Aristotle presents the lyre strings as a paradigm for middle-oriented arrangement, and that this was best seen in the ancient heptachordal nomenclature, it seems that the five *Problems* belong to a still broader Peripatetic discussion about the disruption of the heptachord by Aristoxenus’ octachordal predecessors.
- 9.37 For the musician well-trained in the traditional seven-stringed lyre, pursuing the mean in his τέχνη consisted quite literally in “safeguarding middleness” (μεσότητος σωζούσης).²⁷ An almost lyrical, image emerges from harmonizing the Peripatetic sources—Terpander, the archetypal “good craftsman” of the ancient music, studiously “contemplating” and “working” with “the mid-point” of his heptachord (οἱ δὲ ἀγαθοὶ τεχνῖται . . . πρὸς τοῦτο [sc. τὸ μέσον] βλέποντες ἐργάζονται).²⁸ A final *Problem* serves to bind all the Peripatetic sources together, allying the ancient heptachord not merely with μέση, but making the other strings look towards it:

²⁷ Arist. *EN* 2.6.1106b12.

²⁸ Arist. *EN* 2.6.1106b13ff.; cf. 8f.: πᾶσα ἐπιστήμη . . . πρὸς τὸ μέσον βλέπουσα.

Διὰ τί [τῶν μὲν ἑπτὰ *secl.* Bojesen] μέση καλεῖται, τῶν δὲ ὀκτώ οὐκ ἔστι μέσον; — Ἡ ὅτι ἑπτάχορδοι ἦσαν αἱ ἀρμονίαι τὸ παλαιόν, τὰ δὲ ἑπτὰ ἔχει μέσον. ἔτι ἐπειδὴ τῶν μεταξὺ τῶν ἄκρων τὸ μέσον μόνον ἀρχὴ τίς ἐστίν (ἔστι γὰρ τῶν <εις *ins.* Bojesen> θάτερον τῶν ἄκρων νευόντων ἐν τινι διαστήματι ἀνὰ μέσον ἢ ἀρχή) . . . ἐπεὶ δὲ ἔσχατα μὲν ἐστὶν ἀρμονίας νεάτη καὶ ὑπάτη, τούτων δὲ ἀνὰ μέσον οἱ λοιποὶ φθόγγοι, ὧν ἡ μέση καλουμένη μόνη ἀρχὴ ἐστὶ θατέρου τετραχόρδου, δικαίως μέση καλεῖται· τῶν γὰρ μεταξὺ τινων ἄκρων τὸ μέσον ἦν ἀρχὴ μόνου.²⁹

Why is it called μέση, but there is no middle in a group of eight? Is it because the ἀρμονίαι were heptachords in olden days, and a group of seven has a middle? Further, since the only sort of beginning with things between extremes is the mid-point (for within some interval the beginning of extremes which point the one at the other is in the middle) . . . And since the extremes of ἀρμονία are νεάτη and ὑπάτη, and in the middle of these are the remaining notes, of which the one actually called μέση is the only beginning of either tetrachord, μέση is justly named; because in a group between two extremes only the middle is the beginning (ἀρχή).

9.38 This passage also helps to elucidate sources which stress the three strings ὑπάτη-μέση-νήτη, revealing the dependence of this conception on the centralized heptachord. By the first century A.D. this trio of names seems to have become conventional, Thrasyllus, for instance, citing them merely as typical examples of the “attuned note” (φθόγγος).³⁰ Even here, however, the non-linear sequence μέση-νήτη-ὑπάτη suggests a conception of attunement in which μέση takes a leading part within the boundaries set by νήτη-ὑπάτη.

9.39 Plato, in discussing the tripartition of the just soul, connects it with these strings as the “three boundaries of ἀρμονία” (ὅρους τρεῖς ἀρμονίας).³¹ His passing allusion to “whatever else happens to be between them” (καὶ εἰ ἄλλα ἅττα μεταξὺ τυγχάνει ὄντα) reveals the trio as the schematization of a whole tuning. His sequence νήτη-

²⁹ Ps.-Arist. *Pr.* 19.44.

³⁰ Thrasyllus ap. Theo Sm. 48.6ff.: φθόγγος εἶναι λέγεται οὐ πᾶσα φωνὴ οὐδὲ πάσης φωνῆς τάσις, ἀλλ’ ἡ ἐναρμόνιος, οἷον μέσης, νεάτης, ὑπάτης (“not every sound is said to be a ‘note’, nor even the pitch of every sound, but that which is attuned, like μέση, νεάτη, ὑπάτη”).

³¹ Pl. *Resp.* 4.443d: ὅρους τρεῖς ἀρμονίας ἀτεχνῶς νήτης τε καὶ ὑπάτης καὶ μέσης; cf. Plut. *Plat. quaest.* 1007e-1009b.

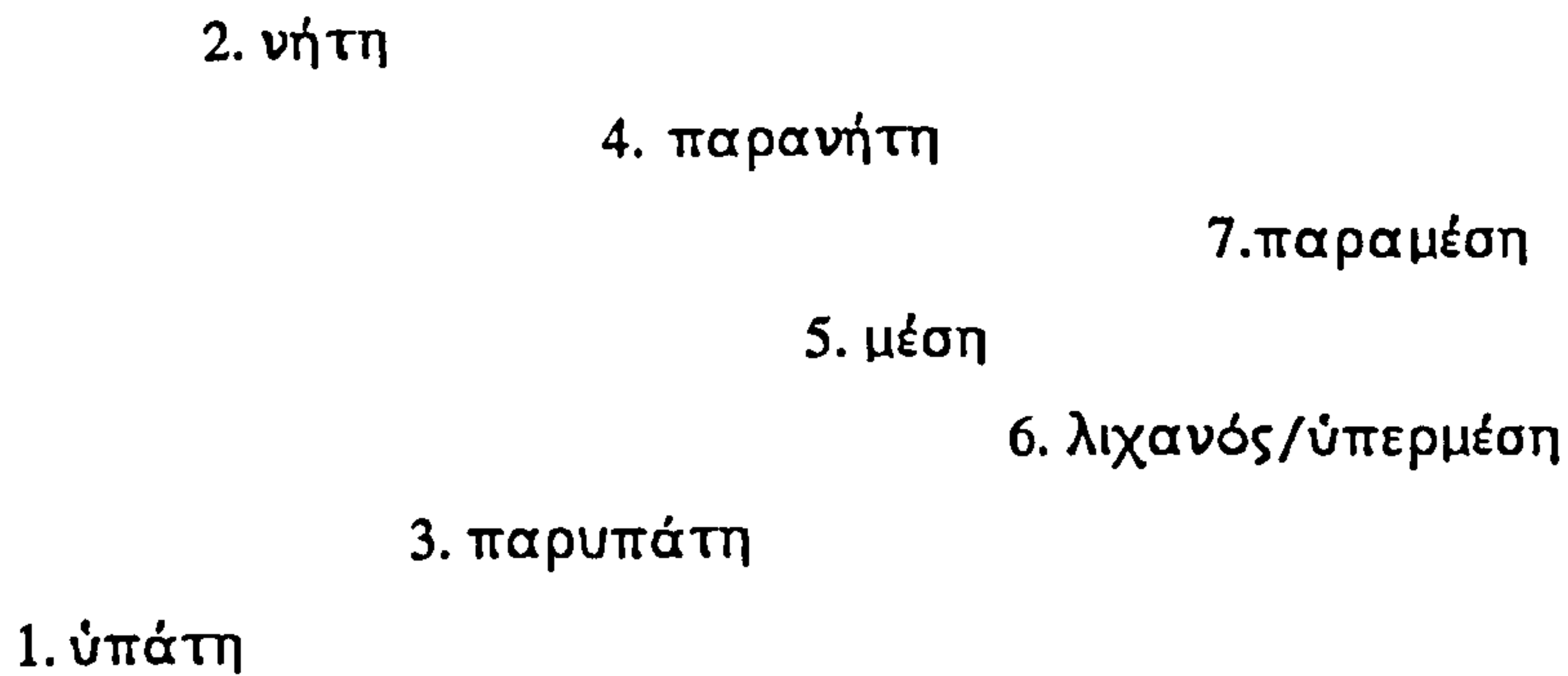
ὑπάτη-μέση is the reverse of that in Thrasyllus, but being equally non-linear has the same effect of advancing μέση over its companions. There is no chronological difficulty in crediting Plato with the same heptachordal familiarity that is found in Aristotle; but it does reveal the extremely fragmentary state of the evidence. His concern for music in the proper old idiom, and for ἁρμονία in both its musical and non-musical senses, is ubiquitous in his writings. Yet never is he any more explicit about a reality of musical practice which must have been one of the first things taught to children by the κιθαριστής. The observation is not limited to Plato, but applies to the Classical authorities generally.

- 9.40 Plutarch, imitating the Platonic passage, reports that the three strings were enshrined as Muses at Delphi, and follows the same sequence νήτη-ὑπάτη-μέση. Here the dominance of μέση is emphasized through a rhetorical crescendo, having besides the only explicitly described function—namely “holding together” (συνέχουσιν) and nourishing mortals and gods, earthly and celestial.³² The relevance of this passage to the function of the epicentric string arrangement is considered in the next chapter. Of interest here is the preservation of the epicentric perspective well past the onset of the octachordal theorists. On the evidence of Dio Chrysostomus, it would seem to have survived in practical music at least until the early second century A.D., perhaps alongside the seven-stringed lyre (see further 10.16).³³ Its sacred status at Delphi, where it was protected by the harmonic god Apollo for its mystical association with cosmic ἁρμονία, must have accorded it a rather high public profile, so to speak. When one considers the ubiquitous references in the Archaic and Classical periods to the seven-stringed lyre of Apollo—not to mention Terpander’s four Pythian victories (cf. 2.3)—Delphi, the ‘center of the world’, appears to be a most secure refuge.
- 9.41 It is safe to say, then, that the ancient arrangement was not entirely forgotten by the educated. Thus Nicomachus, that curator of heptachordal lore, shows the epicentric conception surviving for centuries in the Pythagorean tradition. Once again, the context is one of cosmic ἁρμονία, this time the traditional Harmony of the Spheres, with the musical strings named from the seven heavenly bodies. The exact pairing of each is unimportant; consider rather the sequence in which they are listed:³⁴

³² Plut. *Quaest. conviv.* 744c, 745b, cited in 10.21; cf. *SEG* 30.382 A; Νήτης / Μέσσης B: Ὑπάτης / πρᾶτης; ps.-Censor. *de Mus.* 6.610.1f., where the sequence is *Hypate, Mese, Nete*.

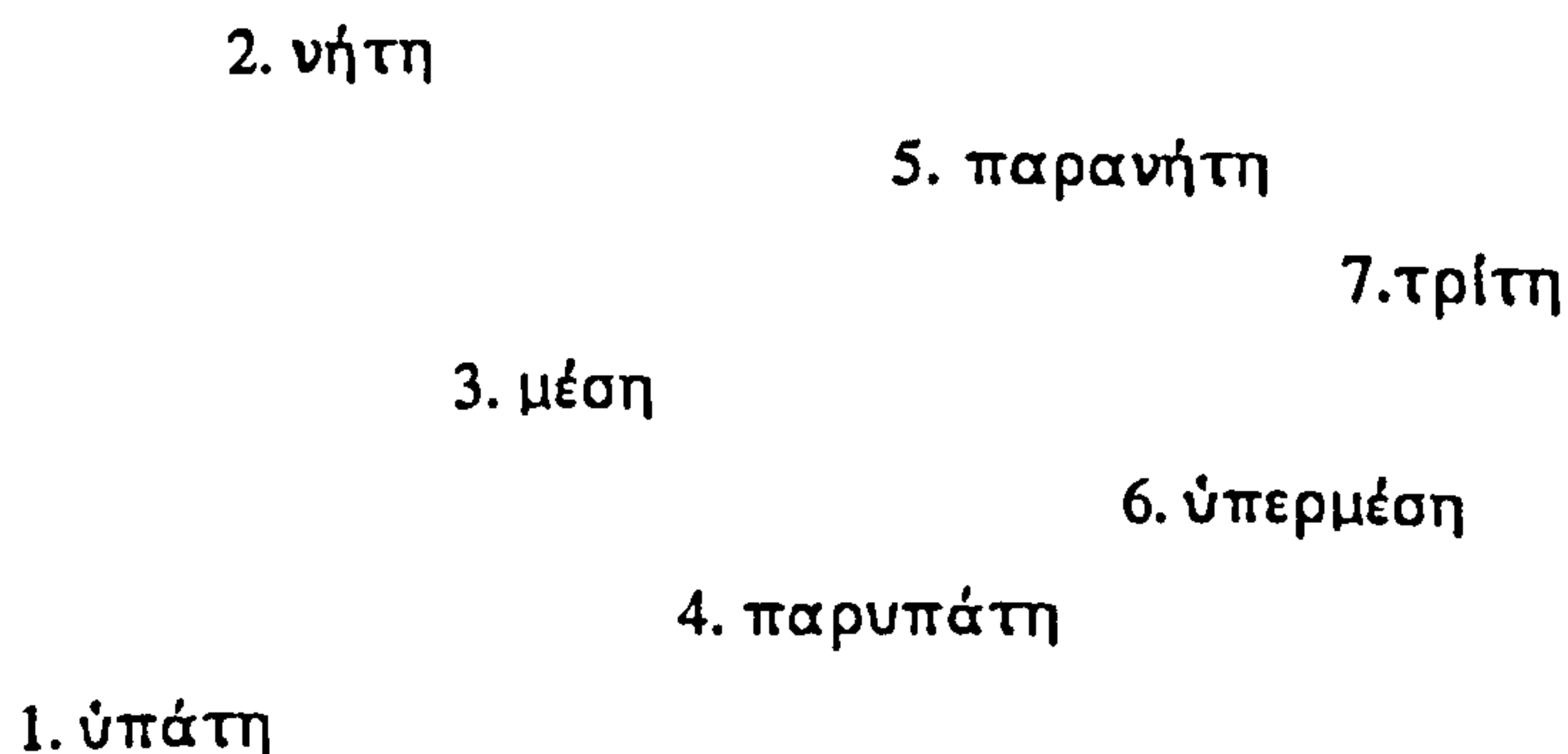
³³ D. Chr. 68.7.

³⁴ Nicom. *Ench.* 3 (241.18-242.11).



The list begins from each extreme alternating in an inward progression: (ὑπάτη, νήτη, παρυπάτη, παρανήτη), jumps to μέση, and then completes the heptachord with the strings on either side. Overall, the sequence is clearly epicentric, and recalls Aristotle's selection, both excluding or subordinating the strings on either side of μέση. Can Aristotle himself have used a standard, "Pythagorean" example familiar to all the educated from the musical παιδεία? Can it be that the finger-names were still recognized as being of a different sort than those which were properly epicentric? In this regard, it is of great interest that Nicomachus uses ὑπερμέση, attested in no other author, as an alternative designation for λιχανός. Like τρίτη, it is formally distinct from the other two systems, and so probably a secondary development; but its conformity to the epicentric perspective is guaranteed by the kinship of ὑπερ- and ὑπάτη, so that it fits into the "upper" half of the converging strings.

- 9.42 One of the Nicomachean *Excerpts* presents a different set of associations, listing the strings in the following sequence:³⁵



The first three strings are the schematic trio familiar from Plato, Plutarch, and Thrasyllus, once again presented in non-linear, i.e. epicentric fashion. The remaining

³⁵ Nicom. *Exc.* 3 (271.16-272.6). It is tempting to equate one of the two conflicting systems debated in 272.9ff. with that of Thrasyllus, mentioned at Theo Sm. 93.9-11; 205.5f.

strings are listed inwardly. Of great interest is that the finger names παραμέση or λιχανός are not given, but rather ὑπερμέση and τρίτη, the two variants which ‘correct’ them to yield a more explicit epicentric τάξις.

- 9.43 According to Boethius, Nicomachus knew a tradition which made Terpander complete the heptachord in imitation of the seven planets.³⁶ Historically, of course, this is worthless—and seems to conflict with the seven-stringed lyre catalogue of the first *Excerpt*—but it does tend to confirm that Nicomachus’ epicentric presentation elsewhere was part and parcel of the traditional lore of the Terpendrean heptachord. Boethius himself goes on to give his own derivative list of string/planet pairings,³⁷ which, curiously enough, he presents in a predominantly linear sequence, though a hint of the epicentric is retained:

6. νήτη
7. παρανήτη
5. παραμέση
4. μέση
3. λιχανός
2. παρυπάτη
1. ὑπάτη

In keeping with the left-to-right approach, Boethius uses neither ὑπερμέση nor τρίτη, though he does go on to acknowledge the latter as an alternative for παραμέση.

- 9.44 Now, Aristotle viewed the strings as running outwards from μέση. By contrast, the Mesopotamian arrangement of U.3011 is numbered inwards; yet here, because the two sets of numbers ascend in parallel, there can be no idea that either of the outer strings, despite being numbered “one”, served as the dominant point of reference. Though fifth and ‘last’, the central string has the only claim to being the formal focus of the nomenclature, and is besides the only unique term. Thus, there is no value in distinguishing between “apocentric” and “proscentric,” or “centrifugal” and “centripetal”, perspectives. Whether one counts towards the center or away from it has, in the end, the same effect. As Aristotle stated elsewhere, between two extremes “the middle point is both beginning and end” (οὕτω δὲ τὸ μέσον ἀρχὴ γίγνεται καὶ

³⁶ Boeth. *De inst. mus.* 1.20 (206.10f.): *septimus nervus a Terpendro Lesbio adiunctus est secundum septem scilicet planetarum similitudinem.*

³⁷ Boeth. *De inst. mus.* 1.20 (206.12-27).

τελευτή).³⁸ Accordingly, a term like “palindromic” must be avoided, since the nomenclature only “runs backwards” if the strings are read, seen, or understood from left to right or right to left. The epicentric scheme is inherently incompatible with the left-right or up-down conceptions of scale familiar to us. This perspective begins to dominate with the σύστημα τέλειον, after which the theorists list the octave species in linear fashion. It serves to warn us that the heptachordal organization of sound is likely to have been quite alien to our own musical conceptions, and at least partially different from the music made in the time of and after the σύστημα τέλειον.

- 9.45 Aristotle and Plato prove that the epicentric arrangement was not some corrupt and forgotten relic of the distant past. It was how the Greeks regarded their strings prior to the σύστημα τέλειον, and this appears to have continued, at some level, for centuries afterwards. The centralized nomenclature begins to give some musical solidity to the Archaic heptachordal norm, “the ἁρμονία which our forefathers handed down”. It appears as a structural constant where the scales of Aristides Quintilianus and the Libation Style—the defective octave scales having now been refuted—had otherwise given an impression of chaotic evolution.
- 9.46 The epicentric perspective began to break down with the expansion of the traditional heptachord. The undermining effect of the eighth string is still visible in the alternative values held by τρίτη in Aristoxenean usage (cf. 8.33). The transformative process which culminated in the σύστημα τέλειον, where the disjunct Dorian octachord was used as the basis of all tonal analysis, gave the string names a fixed dynamic value fundamentally incompatible with the earlier heptachordal usage, where the strings could assume a variety of pitches from one ἁρμονία to the next. This radical change of perspective reconciled the fundamentals of Terpandrian heptachordal practice with the great array of novelty developed in the late fifth and fourth centuries. But the confusion this engendered is attested as early as the fourth century in the Aristotelian *Problems*, where the linear perspective of the σύστημα τέλειον stands side by side with vestiges of the epicentric perspective, and the transition from the one to the other is already very imperfectly recalled.
- 9.47 Nevertheless, references to the heptachordal perspective, both conscious and half-conscious, are substantial. Considering that the earliest sources which discuss musical θεωρία explicitly, such as Aristotle and Aristoxenus, were for the most part composed a century or more after heptachordal music began to break down, the

³⁸ Arist. *Ph.* 8.8.262a25.

evidence begins to take on greater weight. When this is allied with the overwhelming ceramic and lexical evidence for heptachordy throughout the Archaic and early Classical periods, it is necessary to accept a more coherent, well-defined, and theoretically formal tradition of music than has been supposed in the past. That Lasus of Hermione could write a *Περὶ μουσικῆς* in the late Archaic period (7.1), and that prior to this there existed a technical vocabulary in epic language (5.14-19), clearly illustrates the high development of this heptachordal musical practice. If the epicentric string arrangement may be shown to have some specific musical relevance, we may come one step closer to understanding, in very broad terms of course, the practical nature of this τέχνη.

10.0 The Symphonic Circle in Greece

- 10.1 The argument used to dissociate the epicentric arrangements of Greece and Mesopotamia has been that such a scheme is simply a natural and convenient way to identify one out of a large number of strings;¹ hence such a perspective could arise independently in two places. Where this was the only evidence adduced to connect Greek and Mesopotamian practice, this was a useful and sufficient rejoinder. Yet several lines of reasoning have now converged to connect Terpander's heptachordal lyre with an Orientalizing, diatonicizing musical movement. Given this framework, kinship rather than independent development emerges as the more economical scenario.
- 10.2 And yet there are a number arguments against the mere convenience of the arrangement. Instruments with many more than the seven strings of the Greek lyre or the nine of the Babylonian *sammû* were widely used in Mesopotamia from very early times: the great harps from the reliefs of Assurbanipal's palace at Nineveh (cf. 1.25), the eleven-stringed 'silver lyre' of Ur,² and the thirty-stringed instruments attested in Sumerian sources.³ For these, an inward numbering would be progressively more impractical. How convenient would it be to call the seventeenth of thirty strings the "thirteenth from the end", if the nine-stringed epicentry is supposed to spare the player the difficulty of counting to seven?
- 10.3 Moreover, since we see from the Nineveh reliefs and elsewhere that instruments of different configurations were played together, imagine the confusion if the second string from the front of one instrument were the fourth, sixth, or some other number on another. The arrangement is only helpful when the count is made from one or other end of the instrument; finding the central string in a large array first and reckoning thence becomes unnecessarily complicated. But this would put the idea of centralization out of focus, since the method might be applied to both an even and odd

¹ West (1993/4), 162: "The inward numbering is not unnatural. For the player it was easier to identify strings in this way than by counting from one end only. The seventh out of an array of nine, for example, was more readily identified as 'third from the end' than as 'number seven'".

² U. 123554 = BM 121199, early third millennium.

³ *MSL* VI 126, line 132; Shulgi B, *UET* VI, No. 81 rev. 8 (^{8th}.SA.XXX); see Kilmer (1965), 263.

number of strings; an inward arrangement on a thirty-stringed instrument, while providing the desired convenience, would yield no central string, or two central strings.

- 10.4 Nor should one suppose that for instruments other than the *sammû* there would have been some alternative nomenclature more convenient to the particular needs of each. While many chordophones and their parts are presented in the remaining columns of tablet U.3011, the nine epicentric strings are the only such system given. This, as well as its position in the first column, suggests that the scheme was more generally relevant—exactly as Greek ἀρμονική, presented by the theorists in terms of strings, provided the harmonic material for ‘music’ as a whole. In fact, the Mesopotamian string names, as well as the interval and tuning vocabulary drawn from them, are used consistently throughout the tablets and in other non-specialist contexts dealing with vocal music, wind-instruments, and strings of every description. The epicentric strings were thus a universal, standardizing construction, applicable to instruments of seven, nine, eleven, or thirty strings—and to the wind instruments that play together with them in the Nineveh reliefs.
- 10.5 From other examples of imported Asian cultural artifacts, one sees a tendency for the unnecessary to be filtered out in the process of adaptation, for the necessary to be translated. Where something concrete and previously unknown in Greece was adopted, its name was also taken over as a loan-word, filling a void in the Greek language; this is seen with a commodity like sesame (σησάμη < Sem. *sâsam*-), or a tool like the writing tablet (δέλτος < W. Sem. *dalt* or *delt*). Other cases which were more conceptual might still entail the borrowing of a linguistic form, like the monetary unit of the μνᾶ. With the alphabet, adopted directly from Phoenician, the Greeks did not lack equivalents for the literal meaning of *aleph*, *bet*, etc., but since these words also identified the letters, which were new technical artifacts, they were Hellenized and retained. Similar cases are the Hurrian adaptation of Akkadian musical vocabulary (cf. 2.9), and the Greek and Etruscan use of Akkadian terms in the art of hepatoscopy or liver divination.⁴ Sometimes a Greek word might serve as a calque for a foreign term, describing the idea just as well; this happened, for example, with the names of the constellations. As I have argued, the same was true of Akkadian *pitnu* and Greek ἀρμονία, both drawn from the language of joinery and applied metaphorically of the tuning process (6.5-7). As the borrowing becomes increasingly abstract, a more general calquing process occurs, as with systems of time, divination, astronomy, and other such institutions, where these were merely ‘retold’ in the Greek language. The

⁴ Burkert (1992), 46-51; West (1997), 48.

logical extreme of this 'translation' process is found in the poetic and mythological material—a literal retelling in Greek of foreign ideas.⁵

- 10.6 We may distill from these parallels the general principle that vital signs of a foreign conception persisted in transmuted but recognizable form. Consider the relationship between the Greek and Mesopotamian strings in this light. While both evince the epicentric arrangement, there is no exact correspondence between the individual names, though one-to-one equivalents could have been found; that the Greek nomenclature includes names drawn from a heterogeneous finger system shows further disregard (cf. 9.24). Moreover, the one arrangement is comprised of seven, the other of nine strings. This suggests that a centralized organization itself, and not the number or names of strings, was the essential feature. The common aesthetic stance of ἀντιφωνία, the redundant octave, attested in both the Greek and Mesopotamian sources (cf. 6.13, 8.42-48, 8.56), guarantees that heptatonic structures could be exhibited in paradigmatic form on seven strings, whereas their expression in nine, equally possible, would add no further tonal information.
- 10.7 CBS 10996 seems to provide an historical link of some sort between the nine strings of the Retuning text and a more streamlined heptachordal expression of the diatonic cycle. The tablet belongs to "a category of Akkadian mathematical texts that consists of lists of constant numbers, or coefficients which are entered together with the objects or operations to which they apply".⁶ Column 2.1-10, for instance, lists how much a cargo boat could hold of various commodities, where the vessel is a mathematical constant by which the other amounts are measured; lines 11ff. list the capacity of other measures or containers.⁷ In other words, these texts are meant to establish equivalencies between different standards.
- 10.8 Excitement about the musical content of column 1, which provided the information needed for deciphering the Retuning Text, has caused the tablet's generic context to pass without further comment since its first publication by Kilmer (1960). And yet, clearly, the musical text, and our reading of it, should be in harmony with this goal of coordination. In fact, two distinct systems of musical measurement are at work. The epicentric strings of U.3011, which derive from the Sumerian period, occur in pairs where their names inherently suggest the ancient nine-stringed enumeration 123454321.

⁵ On these and other adaptations, see Burkert (1992), 28ff.; West (1997), 1-60.

⁶ Kilmer (1960), 273.

⁷ Kilmer (1960), 274f.

But because “second-behind” and “behind” do not occur where expected and are replaced instead with “fore” and “next”, a seven-stringed perspective has been superimposed.

- 10.9 The tablet’s context make us expect these two measures to be reconciled, and this may come from the labeling of the intervals. In the Retuning Text, the diatonic cycle is analyzed and presented using these terms to follow the changing location of the unclear tritone. Thus, while the Symphonic Circle is expressed in nine strings, a basic heptatonic perception is operative already in the Old Babylonian period. CBS 10996 might therefore serve the function of conversion. Yet this is not a sufficient explanation of the text’s purpose; its coordination with the Retuning Text is not absolute, for the latter makes no use of the thirds and sixths recorded in the former. Yet the first column 1 of UET 7/74 does contain all the interval types, as do the Hurrian hymns with their clearly practical context. Taken together, these facts attest that, despite the canonical nine-stringed presentation of the Symphonic Circle, the underlying heptatonic tonal reality was clearly apprehended throughout the larger Mesopotamian musical culture from at least the Old Babylonian period. For the eighth and seventh centuries, the period of interest for the Greek Orientalizing movement, the perspective is guaranteed by the Middle Assyrian VAT 10101 and the Neo-Babylonian U.3011, both of which imply the terminology of CBS 10996.
- 10.10 Note that in the transcription of CBS 10996, because of the antiphonal repetition, the strings have been conventionally represented by the ordinal series 1-2-3-4-5-6-7. This implies a left-right perspective which is not present in the text itself. According to the actual string designations of U.3011, the ‘numbers’ involved are 1234543. Yet the economical omission of “second-behind” and “behind” need entail no replacement of the epicentric approach. A different central string now comes to prominence—the fourth of seven, as in Greece, whose Akkadian designation as Ea-creator has always marked it apart from the Sumerian nomenclature. It might be that CBS 10996 attests, albeit obliquely, the Babylonian adaptation or reanalysis of an older Sumerian system; but clearly there is not enough evidence to elucidate any simple historical relationship. The existence of two standards means that no equation can be definitely drawn between specific Greek and Mesopotamian tunings (Dorian and *nīd qablim*, for instance⁸). That is, in the seven-stringed expression of the Symphonic Circle, would the same progression of tonal relationships now be organized around the fourth string, with the first and ninth strings being cut away, so to speak? Or would the eighth and

ninth strings be omitted, as in CBS 10096, changing the identity of all the tunings? At any rate, all of the seven tunings could be reached from any other through the process of 'interval rotation', so that the diatonic cycle could be begun from any position, regardless of what was considered normative in the Retuning Text.

- 10.11 Thus, in an adaptation where individual string names were entirely discarded, the conflict of the nine- and seven-stringed perspectives—which at any rate might have been awkward only for the Babylonian theorists—could easily have vanished. The very divergence between the particular *details* of the Greek and Mesopotamian string schemes, far from being an obstacle, is a valuable musical clue that the essential feature was the identification of a center. In other words, the epicentric structure is, *as a whole*, a kind of calque. Provided that they emphasize this, the exact designation of the other strings was unimportant; specific Oriental terminology could fall away in the process of adaptation, while the older finger names could be made to uphold the centralized perspective. *madhyama*, the only one of the seven Sanskrit strings that supports a centralized approach, might also be understood in this light (cf. 1.1); there are, besides, philological arguments in favor of seeing *madhyama* as a relic, “applicable to an earlier state of the scale”.⁹
- 10.12 Nor is there any trace in the Greek evidence of a system of interval naming like that of CBS 10996, suggesting that this too was less than vital to the musical art itself. It is true that the interval names occur in the practical context of the Hurrian hymns, where they serve as a kind of notation. But we have no idea of how this system represented the actual music. Since none of the interpretations that have been advanced (cf. 2.9) have been able to coordinate the song lyrics completely with the intervals, it is probable that the ‘notation’ compressed the music according to some kind of tonal shorthand, where the elaboration of the individual musician may have played an important role. In other words, there is no evidence to suggest that the interval names reflect any crucial musical reality. The Symphonic Circle, in its most practical, exportable form, could be learned simply through demonstration on an instrument (cf. 7.8), while as many foreign words and unnecessary refinements as possible would be ignored. Nor are the Greeks of Terpander’s generation likely to have needed a system of notation, since for centuries their musical culture had been transmitted orally.

- 10.13 These arguments lead to the conclusion that the practice of Mesopotamian diatonic music was closely allied to the epicentric arrangement, since this is the one formal feature which may be detected in the Greek evidence, and that this was not incidental or merely convenient but served some definite purpose. There is, in fact, considerable evidence in the Greek sources to relate the centralized heptachord—which is to say μέση—to musical function.
- 10.14 Consider again the passage from Aristotle's *Metaphysics*, discussed in the last chapter, which treats μέση as an ἀρχή with respect to priority of position. The parallel of the chorus leader proved that the Archaic Greek heptachord was focused on the central string, rather than those at either end. But the chorus leader also had a dominant *function* within his group, and this opens the possibility that Aristotle's comparison is coherent on yet another level. For though the examples are adduced in illustration merely of arrangement, the τάξις of the chorus was itself based on the function of the κορυφαῖος. As the best singer, the chorus leader served to set the tone, so to speak, uniting the less certain voices into a coherent group. Thus, according to Demosthenes, "if someone takes away the leader, the rest of the chorus is gone" (τὸν ἡγεμόν' ἂν ἀφέλη τις, οἴχεται ὁ λοιπὸς χορός).¹⁰
- 10.15 This functional dichotomy between leader and chorus finds a striking parallel in one of the Aristotelian *Problems*, which goes on to give some tantalizing details of how μέση served this central function:

Διὰ τί, ἐὰν μὲν ἡ μέση κινηθῇ, καὶ αἱ ἄλλαι χορδαὶ ἡχοῦσι φθειρόμεναι, ἐὰν δὲ αὖ ἡ μὲν μένη τῶν δ' ἄλλων τις κινηθῇ, ἡ κινηθεῖσα μόνη φθείρεται; — "Ἡ ὅτι τὸ ἡρμόσθαι ἐστὶν ἀπάσαις τὸ ἔχειν πῶς πρὸς τὴν μέσην [ἀπάσαις *secl.* Winnington-Ingram], καὶ ἡ τάξις ἡ ἐκάστης ἤδη δι' ἐκείνην.¹¹ ἀρθέντος οὖν τοῦ αἰτίου τοῦ ἡρμόσθαι καὶ τοῦ συνέχοντος οὐκέτι ὁμοίως φαίνεται ὑπάρχειν.

10 D. 21.60.

11 Jan's supplements in this sentence ("Ἡ ὅτι τὸ ἡρμόσθαι <πρὸς τὴν μέσην> ἐστὶν ἀπάσαις, τό <τε> ἔχειν πῶς πρὸς τὴν μέσην ἀπάσαις, καὶ ἡ τάξις ἡ ἐκάστης ἤδη δι' ἐκείνην) are unnecessary. Deleting the second ἀπάσαις would be better, although the tautology does not obscure the sense. I found that I was anticipated in this emendation by Winnington-Ingram in a marginal note to his edition, kept, like the rest of his library, in the Institute of Classical Studies in London.

μιάς δὲ ἀναρμόστου οὔσης. τῆς δὲ μέσης μενούσης εὐλόγως τὸ κατ' αὐτὴν ἐκλείπει μόνον. ταῖς δὲ ἄλλαις ὑπάρχει τὸ ἡρμόσθαι.¹²

Why is it that, if [*sc.* the pitch of] μέση is changed, the other strings also sound spoiled, whereas if μέση remains while one of the other strings is changed, only the changed string is spoiled? Is it because for all the strings being in tune consists of having some relation towards μέση—and the pitch of each is already [*sc.* established] through that string. Thus, when you take away the cause of their being-in-tune [τοῦ ἡρμόσθαι] and that which holds them together [τοῦ συνέχοντος], it no longer appears to be the same. But if one of the strings is out of tune while μέση maintains its pitch, it makes sense for that string alone to be left out of the tuning, since the being-in-tune persists for the others.

10.16 The implication here, that each string is tuned in relation to μέση, is stated explicitly by Dio Chrysostomus:

χρὴ δὲ ὥσπερ ἐν λύρᾳ τὸν μέσον φθόγγον καταστήσαντες ἔπειτα πρὸς τοῦτον ἀρμόζονται τοὺς ἄλλους· εἰ δὲ μὴ, οὔδεμίαν οὔδέποτε ἀρμονίαν ἀποδείξουσιν.¹³

And as in the lyre, one must establish the middle tone, and then tune the others to it; otherwise, they will never display any ἀρμονία.

By the late first or early second century A.D. when this was written, the Platonic (perhaps Damonian, perhaps Pythagorean) analogy, between harmony of mind and that of the lyre, was a hackneyed conceit. Without devotion to knowledge, rather than opinion (φρόνησις vs. δόξα), one's life will be "discordant" and "out-of-tune" (ἀνάρμοστον, ἐκμελῆ). But the passage, unless it be dismissed as pure archaism—elsewhere Dio uses the Spartans' treatment of Timotheus as an exhortation to virtue¹⁴—is valuable for showing that a centralized approach to lyre-tuning persisted into the imperial period. This provides a practical basis for the epicentric string/planet lists of Nicomachus (cf. 9.41-42), doubtless to be connected with the continued use at the popular level, and despite the theorists' elaborate constructions, of the seven-stringed lyre (cf. 7.15).

¹² Ps.-Arist. *Pr.* 19.36.

¹³ D. Chr. 68.7.

¹⁴ D. Chr. 32.67, 33.57.

- 10.17 Thus μέση was “the cause of attunement” (τοῦ αἰτίου τοῦ ἡρμόσθαι), and a proper ἁρμονία was produced only when the other strings were tuned towards this central tone. This lets us understand another passage of Aristotle which attributes to ἁρμονία an ἀρχή, proving that for the philosopher μέση served an important tonal role, and did not merely occupy the central position:

ὅσα γὰρ ἐκ πλειόνων συνέστηκε καὶ γίνεται ἐν τι κοινόν, εἴτε ἐκ συνεχῶν εἴτε ἐκ διηρημένων, ἐν ἅπασιν ἐμφαίνεται τὸ ἄρχον καὶ τὸ ἀρχόμενον, καὶ τοῦτο ἐκ τῆς ἀπάσης φύσεως ἐνυπάρχει τοῖς ἐμψύχοις· καὶ γὰρ ἐν τοῖς μὴ μετέχουσι ζωῆς ἔστι τις ἀρχή, οἷον ἁρμονίας.¹⁵

However many things are composed of a number of parts, whether continuous (συνεχῶν) or discrete, and become some one common thing, in all there appears that which governs [τὸ ἄρχον] and that which is governed [τὸ ἀρχόμενον], and this principle is innate to animate creatures from the whole of nature; and even in things which do not partake of life there is a sort of ἀρχή, as in ἁρμονία.

Aristotle may not be restricting himself to musical ἁρμονία here, but his statement will at least accommodate it. The philosopher uses the word in a number of senses, but, broadly speaking, ἀρχή describes that which begets something dependent, gives it contextual meaning, or renders it knowable.¹⁶ As in the Aristotelian *Problem*, then, μέση is a sort of leader, while the other strings are those which are led.

- 10.18 This passage and *Problem* 19.36 are of further interest for their use of the Peripatetic, ultimately pre-Socratic (7.46), terms συνεχῶν and τοῦ συνέχοντος, for this shines further light on the Aristoxenean rule of συνέχεια. Aristotle allows that a unified group (ἐν τι κοινόν) may be composed of either discrete or ‘continuous’ elements. By contrast, *Problem* 19.36 defines “attunement” as something which is “continuous”—or as I have argued (7.30), “cohesive”. The source of this ‘cohesive attunement’ is said to be μέση.

¹⁵ Arist. *Pol.* 1.2.1254a28-33.

¹⁶ See for example *Metaph.* 4.1012b34-1013a23 for various definitions, such as ἡ δὲ ὁθεν πρῶτον γίνεται ἐνυπάρχοντος . . . ἔτι ὁθεν γνωστὸν τὸ πράγμα πρῶτον, καὶ αὕτη ἀρχή λέγεται τοῦ πράγματος (“[An ἀρχή] is whence it first begins when something exists . . . and again whence a thing is first known, this too is called the ἀρχή of the thing”).

- 10.19 At first glance, there appears to be some disparity between these passages and Aristoxenus' use of συνέχεια. Aristotle and the author of *Problem* 36 have made μέση the "first principle" (ἀρχή) of attunement (ἁρμονία or τὸ ἡρμόσθαι), while for Aristoxenus the first principle of ἁρμονική is the rule of συνέχεια, which creates a coherent μέλος ἡρμωσμένον. Yet *Problem* 19.36 provides a lexical bridge between these two Peripatetic ἀρχαί. Here μέση is said to be the "cause" of both "the cohesive" and "attunement" (τοῦ αἰτίου τοῦ ἡρμόσθαι καὶ τοῦ συνέχοντος). The syntactical coordination suggests that the two gloss each other as parallel creations of the generative force of μέση.
- 10.20 In fact, this linguistic connection between μέση and συνέχεια appears to be echoed in some dry word-play typical of Aristoxenus.¹⁷ For συνέχεια, he asserts, "must be put in the position of a first principle" (θετέον οὖν τοῦτο πρῶτον εἰς ἀρχῆς τάξιν).¹⁸ While τάξις and ἀρχή are common Peripatetic terms, both also have their specific uses in musical terminology. As we have seen, τάξις had long been the proper musicological term for the tuning of strings (cf. 9.31), while μέση was the ἀρχή in both reckoning them (9.28-34) and giving them their point of tonal reference. There is thus a secondary, almost allegorical, level to Aristoxenus' phrase, which might be rendered (somewhat tendentiously) as "this rule of συνέχεια must take the place of the [sc. old] position/tuning of μέση". Without συνέχεια, he concludes, attunement is destroyed (οὐ μὴ ὑπαρχόντος ἀναιρεῖται τὸ ἡρμωσμένον), recalling the statement in *Problem* 19.36 that "if μέση is changed, the other strings also sound spoiled" (ἐὰν μὲν τις τὴν μέσῃν κινηθῇ, καὶ αἱ ἄλλαι χορδαὶ ἡχοῦσι φθειρόμεναι). And elsewhere the Musician wrote:

πολλὰς ἔχοντος διαφορὰς τοῦ ἡρμωσμένου κατὰ τὴν τῶν διαστημάτων σύνθεσιν, ἔστι τι τοιοῦτον ὃ κατὰ παντὸς ἡρμωσμένου ῥηθήσεται ἔν τε καὶ

17 Other examples of such humorless technical punning include the well-known jibe at *Harm.* 2 against the ἁρμονικοί as being interested only in ἁρμονία in its secondary sense of "enharmonic", discussed in 7.6 (cf. ps.-Plut. *de Mus.* 1143e-f); the use at *Harm.* 1 of δύναμιν στοιχειώδη ("elemental significance") to describe the force of ἁρμονική, when the art itself is concerned with the specific δύναμις or 'tonal significance' of the various 'harmonic elements' which result when its own precepts are followed: cf. 7.30; the use at *Harm.* 54 of τὸ πρῶτον καὶ ἀναγκαιότατον τῶν συντεινόντων ("the first and most necessary of the things which apply") to describe the cardinal rule of συνέχεια, which is best exemplified by the "tense" diatonic (διάτονον σύντονον).

18 Aristox. *Harm.* 54.

ταυτόν. τοιαύτην ἔχον δύναμιν οἷαν αὐτὴν ἀναιρουμένην ἀναιρεῖν τὸ ἡρμοσμένον.¹⁹

Although attunement [τὸ ἡρμοσμένον] has many differences with respect to the composition of intervals, for attunement as a whole there is a certain something which will be stated, a single unitary principle having such a force that if it is removed, attunement is also removed.

There is, then, strong lexical cohesion among the Peripatetic passages—unsurprising given the close professional association of the authors. For the Greek reader of decent musical education, it would be clear that Aristoxenus understands his cardinal rule of diatonic cohesion in relation to a classical method of tuning which is driven by μέση.

10.21 Plutarch provides further evidence for associating μέση with συνέχεια:

συνηρτῆσθαι δὲ πάσας καὶ συντετάχθαι κατὰ λόγους ἑναρμονίους. ζῶν ἐκάστης φύλακα Μοῦσαν εἶναι, τῆς μὲν πρώτης Ὑπάτην, τῆς δ' ἐσχάτης Νεάτην. Μέσῃν δὲ τῆς μεταξύ, συνέχουσιν ἅμα καὶ συνεπιστρέφουσιν . . . τὰ θνητὰ τοῖς θεοῖς καὶ τὰ περίγεια τοῖς οὐρανίοις.²⁰

All are harmonized and deployed together in accord with harmonic ratios, of each of which a Muse is guardian—Ὑπάτη of the first, Νεάτη of the last, and of the middle there is Μέση, holding together [sun°xousan] and nourishing mortals with gods, earthly things with celestial.

This passage corroborates the Aristotelian Problems, making the “cohesion” of the other strings dependent upon μέση: here the inadequacy of the translation “continuity” for συνέχεια, at least in its musical sense, is obvious. As argued in the last chapter (9.38-39), the mention of only ὑπάτη, νήτη, and μέση—the last emphasized in the tricolon crescendo—serves to schematize the epicentric arrangement, what Plutarch had earlier called the “boundaries” (ὅροι).²¹ His language is drawn from Plato, who, in comparing musical harmony to that which unifies the tripartite soul,

¹⁹ Aristox. *Harm.* 19.

²⁰ Plut. *Quaest. conviv.* 745b.

²¹ Plut. *Quaest. conviv.* 744c: οἱ τὰ διαστήματα παρέχοντες ὅροι, νήτη καὶ μέση καὶ ὑπάτη.

states that the three strings are “the boundaries of ἀρμονία”—all but ignoring the others:

συναρμόσαντα τρία ὄντα, ὥσπερ ὅρους τρεῖς ἀρμονίας ἀτεχνῶς, νεάτης τε καὶ ὑπάτης καὶ μέσης, καὶ εἰ ἄλλα ἄττα μεταξύ τυγχάνει ὄντα, πάντα ταῦτα συνδήσαντα καὶ παντάπασιν ἓνα γενόμενον ἐκ πολλῶν, σῶφρονα καὶ ἡρμωσμένον.²²

. . . harmonizing the three things which are, like the three boundaries of ἀρμονία—quite literally νήτη, ὑπάτη, and μέση (and if there happen to be some other things in between)—binding all these things together and for all becoming one from many, wise, and harmonized.

- 10.22 The idea of harmonic boundaries (ὅρους . . . ἀρμονίας) recalls Aristotle’s use of the epicentric arrangement as an example of something “defined in relation to some one thing” (πρὸς τι ἐν ὠρισμένον: cf. 9.27). The notion of μέση as a conjoining force (συνδήσαντα) is repeated in the Myth of Er, where the central light (κατὰ μέσον τὸ φῶς) is said to be the “binding agent of the universe” (σύνδεσμον τοῦ οὐρανοῦ), “holding together the entire rotation” (πᾶσαν συνέχον τὴν περιφορὰν)²³—important testimony for connecting the diatonic cycle with epicentric arrangement (cf. 10.40). Plato’s language recalls another of the Aristotelian *Problems*, where μέση is compared to a grammatical conjunction (σύνδεσμος) in its “binding together” of the other strings:

καθάπερ ἐκ τῶν λόγων ἐνίων ἐξαιρεθέντων συνδέσμων οὐκ ἔστιν ὁ λόγος Ἑλληνικός, οἷον τὸ τέ καὶ τὸ καί. ἐνιοὶ δὲ οὐθὲν λυποῦσι, διὰ τὸ τοῖς μὲν ἀναγκαῖον εἶναι χρῆσθαι πολλάκις, εἰ ἔσται λόγος, τοῖς δὲ μή. οὕτω καὶ τῶν φθόγγων ἡ μέση ὥσπερ σύνδεσμός ἐστι.²⁴

. . . just as it is not Greek when some conjunctions are removed from speech, for example τε and καί. But some words cause no problem, since it is necessary to use certain words often, if it is to be intelligible speech, but others not. Likewise, of musical notes, μέση is like a conjunction.

22 Pl. *Resp.* 4.443d-e.

23 Pl. *Resp.* 10.616b-c.

24 Ps.-Arist. *Pr.* 19.20.

10.23 The analogy might seem inane and of little help in understanding the function of μέση. But the *Problem* derives from a larger pattern of involvement between the musical and grammatical. In the euphonist theory refuted by Philodemus, we find an inversion of the analogy in *Problem* 19.20, so that a musical example is used to illustrate speech: when phonological elements are assembled in certain correct sequences, proper Greek (ἑλληνισμός) supervenes as a sort of harmony (ἁρμογή τις).²⁵ Musical influence on grammatical language and concepts has been traced to the atomist and Pythagorean theory of the fifth century.²⁶ This surely derives from the pairing of the two in education. Indeed, Archytas and Aristoxenus both held that γραμματική was actually a subdiscipline of μουσική.²⁷ But that the two passages just cited exploit the same analogy from opposite viewpoints suggests that the relationship was generally bilateral. The Greek notation, with notes designated by letters, is a perfect fusion of the musical and grammatical, providing a pre-Democritan archetype which goes back to the sixth century (cf. 7.57). In their basic, unmodified positions, the letters follow the diatonic progression.²⁸ This shines light on Aristoxenus' comparison of συνέχεια to the composition of words from letters, which are combined, not at random, but according to meaningful, known sequences.²⁹ Indeed, Aristoxenus' title ΑΡΜΟΝΙΚΑ ΣΤΟΙΧΕΙΑ itself alludes to the notion of musical "letters" (στοιχεῖα), so that ἁρμονική becomes a harmonic grammar in accord with the diatonic principles of συνέχεια, "the practice concerning attunement" (τὴν περὶ τὸ ἡρμωσμένον πραγματεῖαν).³⁰ Thus, in *Problem* 19.20, μέση may be understood as joining disparate harmonic 'words', formed through the cohesion (συνέχεια) of individual elements (στοιχεῖα). These 'words' (tetrachords?) would have a certain independent

25 Philodem. *Poem.* 1.94.22-5 (Janko): ὧν πάντων ὀρθῶς [εὐρισ]κομένων ἑλλην[ισ]μὸς ἀποτελεῖται, καὶ ἁρμογή τις ἐστὶ τούτων ("when all of which [*sc.* these phonological elements] are correctly found, true Greek is produced, and there is a sort of harmony of these").

26 See Janko (2000), 173ff.

27 Aristox. fr. 72 = Quint. *Inst.* 1.10.17: *grammaticae quondam ac musicae iunctae fuerunt, si quidem Archytas atque Aristoxenus [v.l. Euenus] etiam subiectam grammaticen musicae putaverunt*; cf. Isid. *Etym.* 3.16.2: *eratque tam turpe musicam nescire quam litteras*

28 West (1992), 262.

29 Aristox. *Harm.* 27: φαίνεται δὲ τοιαύτη τις φύσις εἶναι τοῦ συνεχοῦς ἐν τῇ μελωδίᾳ οἷα καὶ ἐν τῇ λέξει περὶ τὴν τῶν γραμμάτων σύνθεσιν κ.τ.λ.; cf. *Harm.* 37; *Rhythm.* 2.8; abstracted at ps.-Plut. *de Mus.* 1144a-c, where the connection with συνέχεια is again explicit.

30 Alys. 1 (367.5f.).

intelligibility, but would still need a central binding agent (σύνδεσμος) to conjoin them in syntactically intelligible sequences. When all these elements are present, ἀρμονία supervenes.

- 10.24 The first part of *Problem* 19.20, which the grammatical analogy is intended to illuminate, proves that μέση was not merely a useful ‘conjunction’ in the theoretical analysis of scales, or simply a tuning-tone, but served rather a tonal role in both the composition and actual performance of music:

Διὰ τί, ἐὰν μὲν τις τὴν μέσην κινήσῃ ἡμῶν, ἀρμόσας τὰς ἄλλας χορδὰς, καὶ χρῆται τῷ ὀργάνῳ, οὐ μόνον ὅταν κατὰ τὸν τῆς μέσης γένηται φθόγγον, λυπεῖ καὶ φαίνεται ἀνάρμοστον, ἀλλὰ καὶ κατὰ τὴν ἄλλην μελωδίαν· ἐὰν δὲ τὴν λιχανὸν ἢ τινα ἄλλον φθόγγον, τότε φαίνεται διαφέρειν μόνον, ὅταν κάκεινῃ τις χρῆται; Ἡ εὐλόγως τοῦτο συμβαίνει; πάντα γὰρ τὰ χρηστὰ μέλη πολλάκις τῇ μέσῃ χρῆται, καὶ πάντες οἱ ἀγαθοὶ ποιηταὶ πυκνὰ πρὸς τὴν μέσην ἀπαντῶσι, κἂν ἀπέλθωσι, ταχὺ ἐπανέρχονται, πρὸς δὲ ἄλλην οὕτως οὐδεμίαν.³¹

Why is it that, if someone moves μέση, after tuning the other strings, and uses the instrument, it grates and sounds out of tune, not only when it comes to μέση, but also during the rest of the melody; yet if someone changes λιχανός or some other note, then the instrument appears to be out of tune only when someone uses that string? Is this only to be expected? For all good melodies make frequent use of μέση, and all the good composers . . . if they depart from μέση, quickly return to it, as they do to no other string.

- 10.25 This passage provided Winnington-Ingram with the only real evidence bearing on his criterion for modal function, namely the hierarchical importance of notes within a tuning; it clearly shows that μέση was “the tonic (or something like a tonic) of all good melodies”. The question, then, was whether this *Problem* referred to thetic or dynamic μέση (cf. 8.2-4). Was the point of tonal reference always μέση as defined in the disjunct Dorian octave, regardless of where the structure appeared, for example, in a complex Hellenistic composition? Or was it the fourth note from the bottom in any species of the octave? Winnington-Ingram seems to have been drawn to the latter explanation, for it “at least provides modal variety; and some of the fragments seem to support it”—a view which had been held by Westphal, Gevaert, and Mountford. The opposite interpretation, embraced by Munro and Macran, was thought to be supported

31 Ps.-Arist. *Pr.* 19.20.

by the Aristotelian Problems, Aristoxenus, and Cleonides, where only the dynamic nomenclature of the σύστημα τέλειον ever seemed to be used. Yet this, too, was unacceptable to Winnington-Ingram, because “it cannot adequately account for the differences of character (ἦθος) so commonly ascribed to them [*sc.* the ἁρμονίαι]”. This dilemma ultimately led him to reject any original equation between the octave species and the Classical ἁρμονίαι; Dorian μέση, which he saw in *Problem* 19.20, was indeed the Greek tonal center, but this was “true only for a limited period, that which saw the systematization of Greek musical theory by Aristoxenus”.³²

- 10.26 One can only wonder how Winnington-Ingram’s views might have changed with the knowledge that systematic, cyclical diatony was not first invented by the Greeks in the fifth or fourth centuries; for, to judge from his collection of offprints,³³ he was almost certainly aware of the cuneiform discoveries. At any rate, the arguments of the last two chapters have undermined some of the *a priori* assumptions he was forced to make by the limitations of the evidence available to him. He held, for instance, that the original thetic nomenclature “in itself . . . implies nothing about the functions of the notes”, while Aristotle, in the *Metaphysics* passage (9.27), was merely “contemplating the arrangement of notes in a scale rather than their functions”.³⁴ Yet it is now clear that Aristotle knew a definite function for μέση, that this was implicit in his example of the epicentric arrangement which looked back to the Archaic heptachord (9.35), and that this system of tuning was very much more ancient than the theorists would lead us to believe. Likewise, the Aristotelian *Problems*, though they do use the dynamic nomenclature of the σύστημα τέλειον, often do so in discussions about this ancient state of affairs; the ambiguities considered in the last chapter derive from a conflict between the dynamic and thetic approaches. Thus we arrive at the pre-Aristoxenean perspective. The Peripatetic testimony about μέση as a sort of tonal center cannot, in fact, be categorically restricted to μέση in the disjunction; Winnington-Ingram himself felt that this hypothesis was “perhaps not very likely in view of the general terms of the text”.³⁵ And yet how can thetic μέση, as the fourth string from either end in the ancient epicentric heptachord, fulfill a consistent role as tonal center in a variety of tunings, if these were not contiguous heptachords?

³² Winnington-Ingram (1936), 6-9; cf. 81-4.

³³ These are also kept at the Institute of Classical Studies in London and contain, like Winnington-Ingram’s edition of Jan (1895), valuable marginalia.

³⁴ Winnington-Ingram (1936), 4.

³⁵ Winnington-Ingram (1936), 8.

10.27 Given the great changes music had undergone since the heptachordy norm of the Archaic and early Classical periods, we might suppose that the epicentric method was no longer sufficient, or that its simple structure had now been obscured by the tonally more elaborate structures of the New Music. πολυχорδία, I have argued, obscured the literal ‘continuity’ or ‘cohesion’ of the ancient seven strings on the crossbar of the lyre (cf. 8.74, 9.30). The rule of συνέχεια let these basic heptatonic structures maintain their identity in a variety of modulatory or ‘polymelic’ musical environments, for instance in the eleven-stringed accompaniments (ῥυθμοῖς ἑνδεκάκρουμάτοις) of the Timothean lyre. The new approach allowed dynamic μέση, as defined in the basic Dorian octachord of the σύστημα τέλειον, to be identified in tone-structures of more than seven strings; but the ancient heptachordal structures were still seen as ‘circulating’ in an abstract tonal realm. Thus we learn from Cleonides that the Aristoxenean revision could account for tuning systems (συστήματα) containing more than one ‘μέση’:

ἀπλᾶ μὲν οὖν ἔστι τὰ πρὸς μίαν μέσιν ἡρμοσμένα, διπλᾶ δὲ τὰ πρὸς δύο, τριπλᾶ δὲ τὰ πρὸς τρεῖς, πολλαπλάσια δὲ τὰ πρὸς πλείονας.³⁶

Simple [*sc.* systems] are those tuned to one μέση, double are those [tuned] to two, triple are those [tuned] to three, multiform are those [tuned] to more.

10.28 Whether a system was single, double, triple, or multiple depends on how many properly constituted μέλη ἡρμοσμένα of the Dorian type could be detected. In the extant work of Aristoxenus, τὸ ἡρμοσμένον, the attuned scale, is only ever allied to the rule of συνέχεια. In Cleonides, however, ἡρμοσμένα shows that similar structures are envisioned, yet here συνέχεια is not adduced; the important thing is rather how the other strings stand in an attuned relationship to μέση. As an Aristoxenean writer, Cleonides’ statement serves to link the master’s definition of “cohesive attunement” (τὸ ἡρμοσμένον) with the Aristotelian descriptions about the prominence of μέση, illuminating an aspect of συνέχεια which has been obscured by the fragmentary state of the *Elementa Harmonica*.

10.29 There is, however, one passage of the treatise which touches on this hidden issue:

³⁶ Cleonid. 11 (201.16ff.); cf. Aristid. Quint. 1.8 (14.23-26): τὰ δὲ μεταβαλλόμενα [*sc.* συστήματα], τὰ πλείους ἔχοντα μέσας.

διὰ τί γὰρ μέσης μὲν καὶ παραμέσης ἓν ἐστὶ διάστημα καὶ πάλιν αὖ μέσης τε καὶ ὑπάτης καὶ τῶν ἄλλων ὅσοι <μή> κινουῦνται τῶν φθόγγων, τὰ δὲ μέσης καὶ λιχανοῦ διαστήματα πολλὰ θετέον εἶναι.³⁷

For why is it that there is one interval between μέση and παραμέση and again between μέση and both ὑπάτη and as many others as do not change pitch, while it must be ruled that there are many intervals between μέση and λιχανός?

Aristoxenus is paraphrasing a common musicological question, which he intends to refute. The form of expression (διὰ τί γὰρ) recalls the Aristotelian *Problems*, perhaps yielding a glimpse of how Aristoxenus' θεωρία represented a reconsideration of older concepts which he needed to justify to his Peripatetic colleagues—who, as we have seen, were concerned with the history of the ancient heptachord and its transformation. The issue at hand is the intonational variability of certain degrees of the scale—the so-called movable strings (οἱ κινούμενοι: cf. 7.2), of which λιχανός is adduced as an example—as against the fixed boundary notes μέση, παραμέση, ὑπάτη (and by implication νήτη). Aristoxenus imagines all possible intervals that might be taken with μέση, dividing them into those of fixed and variable size, as though this is how the problem would naturally be—or was in fact—posed.

- 10.30 Since a number of intervals can arise between a fixed and movable string, some wondered why a different name should not be devised for each magnitude. Aristoxenus rejects the proposal on the grounds that “we will need an infinite number of names” (ἀπείρων ὀνομάτων δεησόμεθα).³⁸ Conversely, such a nomenclature could not differentiate between intervals of identical magnitude which were *not* equivalent “with respect to their tonal meaning” (κατὰ τὴν δύναμιν).³⁹ According to the rule of συνέχεια, for example, a consonant fifth or fourth will occur between successive pairs of strings, yet each has a different tonal meaning within the tuning. By the same token, a distance of five strings might in one tuning span a consonant fifth, but not in another; hence the distinction between τὸ [διάστημα] διὰ πέντε and ἡ [συμφωνία] διὰ πέντε.⁴⁰ Aristoxenus insists that, though the moveable strings vary in

37 Aristox. *Harm.* 47.

38 Aristox. *Harm.* 48.

39 Aristox. *Harm.* 47.

40 Aristox. *Harm.* 48.

their intonation, “the tonal meaning of the notes remain” (τὰς τῶν φθόγγων δυνάμεις διαμένειν),⁴¹ and so he is justified in retaining a single name for each string.

- 10.31 Clearly, then, the concept of δύναμις is one of mutual relation. Thus Ptolemy defines it as “how something stands in relation to something else” (τὸ πρὸς τι πῶς ἔχον),⁴² while Aristoxenus says that the names “have been so called in relation to each other” (πρὸς ἄλληλα γὰρ λέλεκται).⁴³ But since a collection of variable pitches can evince among themselves an infinite number of such dynamic relationships, a limited array of tonal meanings can only come through some structural constant. Cleonides provides us with the Aristoxenean position, that the δύναμις of a note was understood by “how it stands” (τὸ . . . πῶς ἔχειν) in relation to μέση.⁴⁴ The notion of musical “intelligibility”, bestowed by μέση, recalls Aristotle’s definition, cited above, of an ἀρχή as “that from which a thing is known” (ἡ δὲ . . . ὅθεν γνωστὸν τὸ πρᾶγμα). We come full circle to *Problem* 19.36, where the “attunement” and “cohesion” of ἀρμονία consisted in “each note standing in some relation to μέση” (τὸ ἔχειν πῶς πρὸς τὴν μέσιν). Thus, Aristoxenus concludes as he began, with specific examples of δυνάμεις calculated in relation to μέση, where “let this be a sufficient response to their confusion” (πρὸς μὲν τὴν διαπορίαν τοσαῦτα εἰρήσθω) shows that these epicentric examples would be readily intelligible to his audience:

41 Aristox. *Harm.* 49.

42 Ptol. *Harm.* 2.5 (52.10); cf. schol. *ad* 51.18: δύναμιν λέγει τὸν λόγον, ὃν ἔχει ἡ μία χορδὴ πρὸς τὸν ἕτερον.

43 Aristox. *Harm.* 50.

44 Cleonid. 11 (202.3-5): ἀπὸ δὲ τῆς μέσης καὶ τῶν λοιπῶν φθόγγων αἱ δυνάμεις γνωρίζονται, τὸ γὰρ πῶς ἔχειν ἕκαστον αὐτῶν πρὸς τὴν μέσιν φανερώς γίνεται (“And the functions of the rest of the notes are known from μέση, for how each of them is clearly arises in relation to μέση”); cf. Aristox. *Harm.* 36: τὸ περὶ τῶν φθόγγων εἰπεῖν ὅσοι τ’ εἰσὶ καὶ τίνι γνωρίζονται καὶ πότερον τάσεις τινές εἰσιν, ὥσπερ οἱ πολλοὶ ὑπολαμβάνουσιν, ἢ δυνάμεις (“to speak about ‘notes’ [φθόγγοι], how many they are, by what means they are understood, and whether they are mere pitches [τάσεις], as most people suppose, or musical functions [δυνάμεις]”); 69: κατὰ . . . τὰς τῶν φθόγγων τάσεις ἄπειρά πῶς φαίνεται εἶναι τὰ περὶ μέλος, κατὰ δὲ τὰς δυνάμεις . . . πεπερασμένα τε καὶ τεταγμένα (“in terms of the *pitches* of notes, the components of a scale appear to be infinite, but in terms of ‘tonal significance’ they are bounded and ordered”); [Cleonid.] 14 (207.11f.): δύναμις ἐστὶ τάξις φθόγγου, δι’ ἧς γνωρίζομεν τῶν φθόγγων ἕκαστον.

ὥσπερ γὰρ ὁ τέταρτος ἀπὸ τῆς μέσης ὑπάτη πρὸς μέσην λέγεται, οὕτως ὁ ἐχόμενος τῆς μέσης λιχανὸς πρὸς μέσην λέγεται.⁴⁵

For just as the fourth note from μέση is called ὑπάτη in relation to μέση, so the note adjacent to μέση is called λιχανὸς in relation to μέση.

- 10.32 Since δύναμις is defined by mutual relationship, μέση must have its own tonal significance from its relation to the other pitches of a tuning. Thus Cleonides defines the δύναμις of μέση as the position it occupies in the Dorian octave of the Perfect System.⁴⁶ This shows that his statement just cited—τὸ γὰρ πῶς ἔχειν ἕκαστον αὐτῶν πρὸς τὴν μέσην φανερώς γίνεται—refers specifically to the calculation of the normal Dorian dynamic values used throughout Aristoxenian theory. In other words, for Aristoxenus the structural constant which determines δυνάμεις is not the old thetic, but the new dynamic μέση.
- 10.33 Yet it should now be clear from the non-Aristoxenian material that a tonal organization around thetic μέση preceded the σύστημα τέλειον, being the essential function of the epicentric heptachord. The evidence of Dio suggests that it also endured beyond the theoretical innovations of the fourth century, and this is corroborated by Nicomachus and Plutarch, who preserve knowledge of the epicentric heptachord in cosmological contexts. Taken together, the evidence shows that the ancient thetic μέση provided tonal meaning for a number of heptatonic ἀρμονίαι. Variety of ‘mode’—a better word is now needed, perhaps ‘tonal construction’—comes from the changing δυνάμεις of the strings towards μέση, whose pitch is a constant. Conversely, the tonal significance or meaning of μέση would change from one ἀρμονία to the next, since it would be surrounded in each by a different set of pitches. μέση was the source of cohesive diatonic tonality, since these tunings were the original prerogative of the heptatonic lyre in its classical, Terpandrian form. We must accept, in short, that the Greeks knew the diatonic cycle at a very early date, and that this was the “ἀρμονία which our fathers handed down”. I have offered some suggestions as to how the irregular ἀρμονίαι of Aristides Quintilianus and the Libation Music of Olympus could have stood alongside this τέχνη (cf. 1.12, 7.62). Other explanations might be devised. But such tone-structures can no longer exclude the co- or pre-existence of the diatonic octave species.

⁴⁵ Aristox. *Harm.* 50.

⁴⁶ Cleonid. 11 (201.18ff.): ἔστι δὲ μέση φθόγγου δύναμις, ᾧ συμβέβηκε κατὰ μὲν διάζευξιν ἐπὶ μὲν τὸ ὀξύ τόνον ἔχειν ἀσύνθετον κ.τ.λ.

- 10.34 The final proof the larger thesis, that the Greeks learned their diatonic cycle from the Near East, would be to demonstrate a similar epicentric tonal construction in the Mesopotamian musical evidence. It is inconceivable that two musical traditions, geographically adjacent, could not only develop, independently, analogous centralized string-nomenclatures, but also endow them with analogous musical functions. Indeed, given the historical and technical framework that has now been established, even the most distant sympathy should suffice to close the case—which is fortunate, because very little new information can be bled from the tablets.
- 10.35 One issue which has remained open is the extent to which the Retuning Text should be restored.⁴⁷ Gurney (1968), taking a practical view of the text, would restore the cycle from *išartum* to *išartum*, that is, through eight phases—the cycle being complete only when the first tuning has been replicated one semitone higher or lower (depending on direction of pitch). A musician could then proceed to any of the seven tunings by the most direct route, three strings at the most ever needing to be retuned.⁴⁸ The change of pitch in the repeated first tuning would be unimportant if the musician were a soloist, since a pitch standard would not be needed to coordinate several instruments. In favor of the practical view, one might cite the text's second-person form of address.
- 10.36 Crocker (1997), however, sees the return to *išartum* as redundant; the diatonic cycle comprises seven distinct pitch-sets, and when these have been shown, the text should be complete.⁴⁹ I have already argued that the Retuning Text was a universal tone-

47 See Wulstan (1968), 221; Gurney (1968) 232f.; Duchesne-Guillemin (1969a), 12; Gurney (1994), 102ff.

48 Gurney (1994), 104: "It seemed obvious that without this the cycle would not be complete; there would be no instruction for retuning from *išartum* to *qablutum* or vice versa . . . This text would be used by any solo player who knew he had a particular tuning and wished to convert it into another. He was free to choose his own pitch, and with this scheme no more than three strings would ever need to be retuned at a time. But without the initial and final *išartum* six steps would be necessary to convert *qablutum* into *išartum* and vice versa, when it could be done in one".

49 Crocker (1997), 193f.: "It seems to be essential to the tuning text to proceed by *consistently* tightening strings, or, alternatively, by consistently loosening them . . . When we execute the procedure in this way, each alteration of a string produces a new configuration of tones and semitones within the octave . . . Furthermore, while each

system useful for all musicians, not merely soloists (10.2-4). It also seems likely that a well-trained musician would know how to change his tunings without needing to consult a textbook; as I have argued (10.12), the lack of specific Akkadian terminology in the Greek evidence suggests that diatonic music could be learned orally, without the written documentation of the tablets. Important textual parallels come from CBS 10996 which, in its omission of the antiphonal octave (6.13), demonstrates a similar disregard for the redundancy of heptatonic phenomena; and from VAT 10101, which lists only the seven tuning names (U.3011 cannot be used to support either case, for the tablet is incomplete).

- 10.37 Beyond this, one can do no better than to cite the Greek view (cf. 7.25) that “Seven are the pitches of the octave, and the tunings are the same in number” (ἑπτὰ δὲ φθόγγοι τῆς διὰ πασῶν καὶ ἁρμονίαι τοσαῦται).⁵⁰ The most eloquent statement of this position is Ptolemy’s argument for seven rather than eight or more τόνοι; the technical perspective is different from that of the Retuning Text, but the underlying tonal issue is identical:

ὥς οἱ μὲν ἐνδοτέρω τοῦ διὰ πασῶν ἀφορίζοντες τοὺς ἄκρους τῶν τόνων οὐκ ἂν εἶεν ἀποκαθεστηκότες τὸ ἡρμοσμένον—ἔσται γὰρ τις ὑπὲρ αὐτοὺς ἀνόμοιος ἅπασι τοῖς πρώτοις—οἱ δὲ ὑπερεκπίπτοντες τοῦ διὰ πασῶν τοὺς ἀπ’ αὐτοῦ τοῦ διὰ πασῶν ἀπωτέρω παρελκόντως ὑποτίθενται, τοὺς αὐτοὺς αἰὲν γινομένους τοῖς προειλημμένοις . . . οὐ δεόντως οὖν οὐδὲ οἱ μέχρι μόνου τοῦ διὰ πασῶν προελθόντες συγκαταριθμοῦσι τοῖς τόνοις τὸν τῷ ἐξαρχῆς διὰ πασῶν. ταύτῳ γὰρ φανήσονται πεπονθότες τοῖς ὑπερβαίνουσι τὸν ἐκκείμενον ὅρον, πλήν καθ’ ὅσον οὗτοι μὲν ἐφ’ ἐνός, ἐκεῖνοι δὲ ἐπὶ πλείονων . . . εἰ γὰρ ἅπαξ λαμβάνεται τις ὁ αὐτὸς ἐπὶ τῶν προκειμένων ὥς ὁ διὰ πασῶν τῷ ἐξαρχῆς, τί κωλύει, φήσαιεν ἂν, προστίθεσθαι καὶ τοὺς τοῖς λοιποῖς ἐξῆς ὄντας ἀνάλογον.⁵¹

configuration is different from the preceding one in the process, after seven such configurations the eighth is the same as the first. The order, then, in which the strings are to be altered is of the essence: “Do this, and you will create the seven tunings”. We can conclude that this most elegant expression of the seven tunings was the intended purpose of the retuning text”.

⁵⁰ Alex. Aphr. *In Metaph.* 1093a13.

⁵¹ Ptol. *Harm.* 2.8 (59.6-20).

Thus, those who define the limits of the *τόνοι* at less than an octave would not have cycled through the attunement [*ἀποκαθεσθηκότες τὸ ἡρμοσμένον*]⁵²—for there will remain, besides them, some one *τόνος* beyond, different from all the first ones—but those who blunder beyond the octave redundantly hypothesize their *τόνοι* beyond the octave itself, since these are always the same as the previous ones . . . And so even those who go only as far as the octave ought not to number among the *τόνοι* that one which is at an octave from the first *τόνος*. For clearly they make the same mistake as those who exceed the stated limit, except that this excess is that of one *τόνος*, while theirs is of more . . . For if once some one identical *τόνος* is accepted in addition to those that have gone before, like that which is at an octave from the first, what, they might ask, prevents the next *τόνοι* in the sequence from being added by analogy?

- 10.38 In this light, one should consider a curious, seven-part division of the citharodic *νόμος*, attributed to Terpander himself:

μέρη δὲ τοῦ κιθαρωδικοῦ νόμου, Τερπάνδρου κατανείμαντος, ἑπτὰ· ἀρχά, μεταρχά, κατατροπά, μετακατατροπά, ὀμφαλός, σφραγίς, ἐπίλογος.⁵³

The parts of the citharodic *nomos*, as apportioned by Terpander, are seven: beginning, after-beginning, down-turn, after-down-turn, center (lit. navel), seal, conclusion.

A number of sources attribute specific compositions to Terpander, allegedly named from ethnics, rhythms, and styles.⁵⁴ Like other *νόμοι* of which there is notice, these titles probably derive, for the most part, from the musicologists of the Classical and Hellenistic periods, on the basis of internal features or scholarly deduction.⁵⁴ But the passage of Pollux under consideration is somewhat different. It does not seem to be a

52 Poll. *Onom.* 4.66.

53 Heraclid. Pont. *ap.* ps.-Plut. *De mus.* 1132d: ἐκεῖνος γοῦν τοὺς κιθαρωδικούς πρότερος ὠνόμασε, Βοιωτίον τινα καὶ Αἰόλιον Τροχαῖον τε καὶ Τερπάνδρειον καλῶν, ἀλλὰ μὴν καὶ Τετραοίδιον; Schol. ΕΓ *ad.* Ar. *Ach.* 13: τὸ δε Βοιωτίον μέλος οὕτω καλούμενον, ὅπερ εὔρε Τέρπανδρος, ὥσπερ καὶ τὸ Φρύγιον; *Suda* s.v. ὄρθιον νόμον καὶ τροχαῖον: τοὺς δύο νόμους ἀπὸ τῶν ρυθμῶν ὠνόμασε Τέρπανδρος, ἀνατεταμένοι δ' ἦσαν καὶ εὐτονοί; Phot. *Lex.* s.v. νόμος: ὁ κιθαρωδικὸς τρόπος τῆς μελωδίας, ἀρμονίαν ἔχων τακτὴν καὶ ρυθμὸν ὠρισμένον· ἦσαν δὲ ἑπτὰ οἱ ὑπὸ Τερπάνδρου· ὦν εἰς ὄρθιος, τετράδιος, ὀξύς.

54 See Barker (1982-9), 1.250.

case of individual citharodic νόμοι, for he has already mentioned some of the more familiar Terpandrean pieces.⁵⁵ Nor does it seem to be a particular composition with many sections, for Pollux speaks of *the* citharodic νόμος, as though the sevenfold division somehow embraced the genre as a whole. These names are not attested elsewhere, but Photius also speaks of “the citharodic style of melody . . . there were seven according to Terpander (ὁ κιθαρωδικὸς τρόπος τῆς μελωδίας . . . ἦσαν δὲ ἑπτὰ οἱ ὑπὸ Τερπάνδρου). Interestingly, only three names are given here (ὄρθιος, τετράδιος, ὀξύς)—all of which are attested in the other sources as titles of individual compositions. Together these sources suggest that Terpander was associated with some seven-fold organization of citharodic tuning, even if the precise terminology was largely forgotten.

- 10.39 And yet the names given by Pollux are quite suggestive in relation to the diatonic cycle. This is not to propose a one-to-one relationship with Akkadian terms—although κατατροπά is strikingly similar to *sīhip* (“overturn”), which separates successive tunings in U.3011, as though encapsulating in a single word the modulatory process which is detailed in the Retuning Text. More important is the general sense of progression to the names, with a definite starting point (ἀρχά) followed by something of the same kind but next in sequence (μεταρχά); κατατροπά and μετακατατροπά lend themselves to a similar motion. This might recall the pairs Lydian/Hypolydian, Phrygian/Hypophrygian, Dorian/Hypodorian, the τόνοι separated from each other by a fourth in the Perfect System, but with the same structural differences as successive tunings in the Symphonic Circle. ὀμφαλός, occupying the fifth rather than fourth of seven positions, is not precisely the “navel”; but in view of the Greek and Mesopotamian emphasis on musical middleness, including the tuning *qablūtum*, the term is certainly pregnant. σφραγίς and ἐπίλογος might seem better suited to sections of an individual composition, though ἐπίλογος could be the “conclusion” to any type of sequence. Overall, then, Terpander’s seven-part citharodic νόμος could distantly attest the full cycle that would naturally accompany the heptatonic instrument he is said to have invented. The motley collection of names might be accounted for by the same logic used to explain the titles of other νόμοι; an historically accurate sevenfold division could have been filled in with terms cobbled together from incomplete information by educated guess-work.

⁵⁵ Poll. *Onom.* 4.65: νόμοι δ’ οἱ Τερπάνδρου ἀπὸ μὲν τῶν ἐθνῶν ὄθεν ἦν. Αἰόλιος καὶ Βοιωτίας, ἀπὸ δὲ ρυθμῶν ὄρθιος καὶ τροχαῖος. ἀπὸ δὲ τρόπων ὀξύς καὶ τετραοῖδιος. ἀπὸ δ’ αὐτοῦ καὶ τοῦ ἐρωμένου Τερπάνδρειος καὶ Καπίων.

- 10.40 If one accepts that the Retuning Text gave seven rather than eight phases, a provocative correlation between the nine epicentric strings and the Symphonic Circle presents itself; for in this case, it will be noticed, the fifth string is the only one of the company whose pitch does not change (see diagram in Appendix B). This would let us see the arrangement 123454321, with all the strings so ordered to emphasize a centerpoint, as a sort of illustration of the musical phenomena of the Retuning Text. This would also serve to link the two halves of U.3011 column 1, where the epicentric strings are followed closely or immediately (depending on the exemplar) by a list of the tunings which they express, in the same order that they occur in the Symphonic Circle. The parallels to the Greek material discussed above should be obvious, in particular *Problem* 19.36 with its implication that the pitch of μέση is not to be moved, lest the tuning of the other strings be damaged.
- 10.41 The evidence is sufficient, I hope, to prove finally an historical connection between the Greek art of ἀρμονική and the Symphonic Circle of Mesopotamia. The evidence suggests a centralized approach to diatonic music which goes far beyond a mere arrangement of convenience. *pitnu*, ἀρμονία, and διάτονος itself reveal a very ancient metaphor of tonal construction. This is consistent with the concept of δύναμις, the ‘tonal meaning’ which arises from the connection of two pitches. In the Archaic Greek heptatonic lyre, this tonality was built up through a tuning’s relation to μέση, and this τέχνη continued well beyond the polychordal period. Further examination of the evidence for “epicentric tonal construction” might yield a more coherent and detailed picture. For it is now seen that nearly every key concept of Greek theory—μέση, συνέχεια, δύναμις, the τόνοι, the mechanism of μεταβολή, the process of interval rotation, the names of the fourth, fifth, and octave—has its roots in the Archaic heptachordal melic. With the diatonic cycle as a constant in the history of Greek music from the Orientalizing period onwards, the possible explanations for the other phenomena—the scales of Aristides Quintilianus, the Libation music, the origin of the γένη, πολυχорδία, and the contributions of the New Musicians—may be greatly constrained. It may even be possible to deduce from the Greek evidence more information about the ancient Mesopotamian artform itself—the original Invention of Music.

APPENDIX A

The Etymology of *Harmonia*

- A.1 The survival of the Mycenaean lyre finds a number of further, specifically harmonic, parallels. The PIE root **ar-* (“to fit or join”) was highly productive throughout the Indo-European family, and Greek is no exception; but an important development of this root, represented by ἁρμονία and ἁρμόζω, may be traced specifically to the palatial culture of the Mycenaean period, where it is most conspicuous in the language of chariotry. The fundamental derivative is *a-mo* (ἄρμω), a neuter singular formed on the root **ἄρ-* with the concrete noun-forming suffix *-mḥ*;¹ the literal meaning of the word is “joined object”, but in the tablets designates the chariot wheel, because this was the “joined object” *par excellence*. The word usually occurs in the plural *a-mo-ta* (ἄρμωτα),² as chariot wheels typically come in pairs; but the singular is also attested.³ Both forms find Homeric parallels in ἄρμα and ἄρματα—with an alternate vocalization of the suffix *-mḥ* to be considered below—used interchangeably for “chariot”. The Homeric plural is intelligible enough: one’s “wheels”, i.e. car, is a familiar expression in English. The singular ἄρμα might be explained as an anachronistic back-formation from ἄρματα. Alternatively one may suppose that the singular “wheel” could itself stand for the whole chariot; this is possible plausible, given that these vehicles were two-wheeled, and that in the tablets wheels are consistently treated as pairs (where the abbreviated *ze* is equivalent to ζεύγος),⁴ frequently described by dual adjectives, while with the dual form *a-mo-te* (= ἄρμωτε) is also attested.⁵ The ideogram too, which typically designates a pair, appears as a single wheel, as though we were looking at them from the side.⁶ A third possibility is that **armḥ* had, in one or more dialects, a parallel substantival sense, for a chariot is as much a “joined thing” as is a wheel.

¹ See Buck/Petersen (1945), 221.

² KN So894, So 0437, So 0439, So 0440, So 0430, So 0442; PY Sa01, Sa 02, Sa 787, Sa 793, Sa 790, Sa 682, Sa 03 (= DMG 278-291).

³ KN Sg 1811.

⁴ KN So 0439 (= DMG 280); cf. Ventris/Chadwick (1956), 54, 370; Hooker (1980), 165.

⁵ KN So 0442 (= DMG 283); cf. Ventris/Chadwick (1956), 370.

⁶ Palmer (1963), 320.

- A.2 Besides providing specific words for “wheel” and “vehicle”, derivatives of *ἄρ- are found in more general chariotry contexts. Of the three ideograms for chariot (240-242),⁷ the verbal form *a-na-mo-to* (ἀνάρμοστοι or ἀνάρμοτοι: see below) accompanies the vehicle in its most disassembled state (242), without side-extensions, pole-stay or yoke; it is completely “unfitted”.⁸ *a-ra-ro-mo-te-me-na* (ἀραρμοτμένα) describes the chariot in its second state of assembly, without wheels but otherwise “fitted out” (241).⁹ The completely assembled is shown in ideogram 240; Homer describes the process of attaching wheels to the chariot, and wheels and vehicles were listed separately in the tablets from the armoury at Knossos.¹⁰ Likewise in Homer we find, in addition to the ubiquitous ἄρμα and ἄρματα, a four-wheeled vehicle (ἄπῆνη) described as ὑπερτερὴ ἀραρυῖαν (“fitted with a compartment”);¹¹ with this one may compare *a-ra-ru-ja a-ni-ja-pi* (ἀραρυῖα ἀνίαφι), “fitted with reins”, found in many of the chariot tablets cited.
- A.3 *a-mo*, *a-mo-ta*, *a-ra-ro-mo-te-me-na* and *a-na-mo-to* all exhibit the characteristic vocalization of the sonant nasal as *o-*, rather than the *a-* which characterizes other Greek dialects; thus Mycenaean ἄρμο/ἄρμοτα contrast with the ἄρμα/ἄρματα of Homer.¹² Because the same phonetic doublet occurs within the Linear B corpus itself—*pe-mo* alongside *pe-ma* (<**spermḗ*), for instance—it is necessary to distinguish between ‘normal’ Mycenaean, the aristocratic koine which prevails in the tablets,¹³ and
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- 7 Ventris/Chadwick (1956), 51, 361.
- 8 Ventris/Chadwick (1956), 362; cf. Sf 0421, Sf 0420 (= *DMG* 272-3).
- 9 KN Sd 0403, Sd 0401, Sd 0409 + 0481, Sd 0413, Sd 0404, Sd 0402, Sd 0422 (= *DMG* 265-271).
- 10 Hom. *Il.* 5.722-32.
- 11 Hom. *Od.* 6.70.
- 12 Ruijgh (1961), 204ff., argues that this vocalization was formed by analogy rather than regular development.
- 13 On the general uniformity of the dialect, see Ventris/Chadwick (1956), 75f.

the 'special' forms of certain scribes who betray local dialectal differences.¹⁴ The exact relationships of the Greek dialects to each other, and how this reflects the historical movements of the Bronze Age, remains a matter of debate.¹⁵ It is probable that Ionic, Aeolic and Cypro-Arcadian had distinguished themselves as regional dialects by the Mycenaean period.¹⁶ Because Mycenaean shows closest affinities with Cypro-Arcadian, the most compelling hypothesis is that a ruling dynasty arose from this dialectal group; the tablets reflect the linguistic identity of this aristocracy, and conceal the dialectal diversity which remained the rule. The position of the Dorians, both geographical and linguistic, remains obscure; but the fact that it shares with Ionic a number of dialectal features shows that a simple family tree will not suffice to represent the complex historical relationships between the dialects: linear and network models must be combined.¹⁷ The development of a koine is characterized by such non-linear developments, and the Mycenaean palace culture, with its unifying force, must have encouraged a certain amount of linguistic 'cross-contamination'.

- A.4 One phenomenon which attests this process is the appearance of characteristic Mycenaean forms across the later dialectal divisions. ἀρμόζω (Doric ἀρμόσδω), appearing throughout the later Greek dialects¹⁸ but showing the characteristic Mycenaean *o*-, is clearly an example of this,¹⁹ but in other respects the word's relation to the attested Mycenaean forms has remained obscure, and its derivatives exhibit a

14 See especially Risch (1966), 157: "On peut penser, par exemple, que le mycénien normal [reflected in the prevailing orthography of the tablets] était la langue de la cour, ou de l'aristocratie, et que le mycénien spécial [reflected in certain divergent spellings] était en réalité la langue des couches inférieures [from which class came these divergent scribes]. L'une est tombée avec la catastrophe qui a détruit les palais mycéniens, tandis que l'autre a survécu." Cf. Ruijgh (1961); Palmer (1963), 41f., 60-4, 320; Hooker (1980), 74f.

15 See for example Chadwick (1976), (1956); Ruijgh (1961); Bartoněk (1966).

16 Ruijgh (1961), 206; Palmer (1963), 62.

17 See Chadwick (1976).

18 Chantraine (1968), 110f.; Frisk (1960), 144; Van Herwerden (1910), 204f.

19 Risch (1966), 157.

number of phonological peculiarities.²⁰ Let us begin with the rough breathing. The sound *ha* may be distinguished from *a* in Linear B by the use of the sign represented by *a*₂.²¹ While the scribes were not consistent in using this, of the thirteen tablets cited for *a-mo-ta* in Ventris/Chadwick (1956), there are no examples of *a*₂-*mo* instead of *a-mo*; the form *a-na-mo-to* confirms this psilosis, since otherwise one should expect **a-a*₂-*mo-to* (*aharmostos*).²² In order to account for the rough breathing, which is a secondary development to the stem **ar-*, it is necessary to postulate the form **arsmḥ*;²³ -*s-* would eventually become -*h-* (cf. *πλοχμός* < **ploksmos*, *αἰχμάς* < *ai-ka-sa-ma* [*aiksmans*]), and then be metathesized to produce an initial aspirate.²⁴ (The form **arsmḥ* may itself have descended from **artmḥ*, with the dental stop *τ* before *μ* yielding *σ*;²⁵ for PIE **ar-* was productive of such derivatives, where a perfect passive coloring may often be inferred: Sanskrit *ṛta*, Old Persian *arta*, Latin *ars*, *art-*, Greek ἀρτύνω). Because ἄρμα/ἄρματα shares with the family of ἀρμόζω the rough breathing, but diverges with respect to the vocalization of -*mḥ*, it is clear that **arsmḥ* antedates the separation of the Eastern Greek dialects; and if, as seems likely, the word occurred naturally in Doric and was not merely an epic borrowing—compare Mycenaean *pe-mo* (σπέρμο) with σπέρμα in both Ionic and Doric—the form goes back to protoethnic Greek: ἄρμο and ἄρμα are cognates. The Mycenaean spelling—i.e. not **a-sa-mo*—shows that the state of the word in the late Bronze Age was **ar(h)mḥ*, with the universal development of rough breathing coming after the time of the tablets.

- A.5 *a-ra-ro-mo-te-me-na* presupposes the form **αρ(h)μότ-ιω*, a denominative verb built on the plural stem *a-mo-t*. The usual rendering of *a-na-mo-to*—ἀνάρμοστος < **ἀνάρμοσ-τος*²⁶—conforms to this, with -*τος* denoting perfect passive action, and the double dental stop *ττ* yielding *στ*.²⁷ Another interpretation of *a-na-mo-to* is possible (see

²⁰ See Heubeck (1961), 169f.; Chantraine (1968), 111.

²¹ Hooker (1980), 50.

²² Lejeune (1972), 242-244, 287-290; (1982), 90, 137f.; See Chantraine (1968), 1.100f.

²³ Lejeune (1972), *loc. cit.*

²⁴ For the process, see Wright (1912), 122 (241).

²⁵ Smyth (1920), 26 (86).

²⁶ Heubeck (1961), 169f.

²⁷ See Smyth (1920), 26 (83).

below), but the forms *a-mo-te-wo* (ἀρ(η)μοτηφος < ἀρμοτεύς) and *a-mo-te-jo-na-de* (ἀρ(η)μοτειωνάδε) all confirm the existence of Mycenaean *αρ(η)μότ-ja. But this verb cannot be directly linked with ἀρμόζω as it appears in the later dialects. The rules of Greek phonology predict the form ἀρμόττω in Cretan (with ἀρμόζω also possible) and Boeotian, ἀρμόσω in Attic-Ionic, and ἀρμόσσω or ἀρμόσω in the other dialects.²⁸ A number of derivatives do in fact agree with these predictions: ἀρμόσσω appears in Hippocrates,²⁹ while *ἀρμόσω in Attic is suggested by the form ἤρμοσα. Likewise, Doric ἀρμοστήρ, with the non-Doric doublet ἀρμοστής, are built on the dental stem ἀρμοτ- attested in Linear B, and in fact we find in Linear B the dative *a-mo-te-re* (ἀρ(η)μοττήρει > ἀρμοστήρει). Given the conservatism of Spartan culture, it is significant that τήρ is the more suffix than -τής (Doric -τάς), by which it was sometimes later replaced;³⁰ of interest here is Hesychius' gloss of ἀρμόσυνοι ἀρχή τις ἐν Λακεδαίμονι ἐπὶ τῆς εὐκοσμίας τῶν γυναικῶν.

- A.6 Working in the other direction from ἀρμόζω, the suffix -ζω could be produced by two distinct historical developments, the combination of the verb suffix -ja with either a voiced dental (-ζω < *-δja, cf. πεζός from *πεδjός) or voiced palatal (-ζω < *-γja, cf. ρέζω > ρέγja). The convergence of these sounds occurred already in protoethic Greek.³¹ In theory then ἀρμόζω should derive from either ἀρ(η)μογ-ja or ἀρ(η)μοδ-ja. And yet the members of the word's family do not themselves let us choose between one archetype or the other, for both roots are suggested simultaneously. The Dorian verbal forms ἄρμοξα, ἀρμόχθην, ἄρμογμαί, as well as ἀρμογή, should derive from *ἀρμογja; Attic ἤρμόσθην and ἤρμοσμαι, besides ἀρμόδιος, require *ἀρμοδja. A further problem is that Attic ἀρμόττω cannot derive from either archetype, nor from Mycenaean

28 Wright (1912), 80 (129.6); 300 (493).

29 Cf. Chantraine (1968), 111.

30 On the verbal adjective suffixes -to-, -ta-, see Buck/Petersen (1945), 302, 544; Wright (1912), 126f. (258). The feminine forms could be used as abstract nouns (cf. ἀρετή), and these sometimes came to denote persons, becoming masculine and taking the -s suffix in first declension. Often -τής did not replace older forms in -τήρ, but was preferred in the creation of new forms.

31 Wright (1912), 81 (129.8).

*αρ(η)μότ-ιω, but should have descended from a stem ending in *k*, *q*, *kh*, *qh*, or *gh*.³² To suppose a regular historical development for all of these forms would require three separate archetypes, none of whose stems are attested in Linear B, alongside the known Mycenaean *αρμότjω which has in fact left authentic descendants in various dialects—the same dialects which are inconsistent in their treatment of αρμόζω. Since it is absurd to suppose multiple ancestors converging on a single descendant, and because the Mycenaean vocalization *o*- points to a global linguistic phenomenon, the inconsistent forms of the Classical dialects cannot be derivatives of αρμόζω, strictly speaking, but formed by analogy from other verbs in -ζω, where the historically dual nature of the suffix could produce forms in both δ and γ, as well as Attic αρμόττω.

- A.7 It is conceivable that all the later anomalies should be attributed to the single inherited *αρ(η)μότ-ιω, where the absence of the palaces' unifying influence cut the word adrift to develop independently in the various dialects by analogy. And yet the dialects are unanimous in making αρμόζω the basic form, and this cannot descend regularly from *αρ(η)μότ-ιω. It seems more economical then to postulate *αρμόζω < *αρ(η)μόζω for Mycenaean as a parallel denominative to *αρ(η)μότ-ιω. Historically, verbs in -jo formed on the suffix -m̥j could develop along one of two lines, depending on the degree to which the sonant nasal had been vocalized. Thus δνομα yielded both δνομάζω and δνομαίνω, θαῦμα both θαυμάζω and θαυμαίνω, where the -αίνω forms are older, being formed when the nasal element of the suffix -m̥j was still capable of affecting the outcome (< *onom̥j-jo);³³ the -άζω verbs were formed by analogy from other verbs in -ζω after -m̥j had been fully vocalized as -μα (δνομα-ζω). Mycenaean αρμόζω must be of this type (αρ(η)μο-ζω), for *arhm̥j-jo would have produced the doublets *αρμοίνω (Mycenaean) and *αρμαίνω (Ionic),³⁴ whereas Homer only knew αρμόζω.
- A.8 It seems then that there existed two parallel denominative verbs, one formed from the plural, the other from the singular stem of *a-mo*: *ar(h)mo-zo/*ar(h)motjo). In fact, it is possible to interpret *a-na-mo-to* as *ἀνάρμο-τοι, drawn from ἀρμο, rather than ἀνάρμοστοι < ἀνάρμοττοι.³⁵ Palmer's (1963) proposal of *a-na-mo-to* to mean "not

32 Wright (1912), 81 (129.7).

33 See Buck/Petersen (1945), 221.

34 Wright (1912), 300 (490).

35 Chantraine (1968), 111.

having *a-mo-ta*", i.e. wheels/undercarriage, cannot be right. Besides the fact that the word requires the perfect, passive sense of the suffix *-tos*,³⁶ this interpretation does not make sense of the chariot ideograms. The word always describes the simple chariot frame; the ideogram showing the next stage of assembly also lacks this wheel assemblage, but is nevertheless called *a-ra-ro-mo-te-me-na*. Thus the two terms must be coupled as opposites, and designate an assembly process prior to the addition of the wheels. Accordingly both verbal forms, though derived from *a-mo/a-mo-ta*, refer not to the specialized sense "wheels", but to the process of joining generally, where "wheel" is the special development of ἄρμος, as neuter verbal adjective from *αρ-, and the verbs are denominative from ἄρμος as "joined-thing" rather than "wheel".

- A.9 It follows that the word ἄρμονία was also extant in Mycenaean times, since it must have been formed from **armṇ-*, with the suffix *(i)jə*, when *-mṇ* could be expressed as *-on-*, i.e. before it was fully vocalized as in ἄρ(η)μος. Lack of attestation is often illusory, and the tablets are restricted to very specific contexts.³⁷ Its existence is confirmed by the fact Homer knew no form *ἄρμάνια with which to replace it (hence no proethnic archetype **arhmṇ-(i)jə*); and further by the juxtaposition of the short syllable *-ov-* with *-ia*, which at an earlier stage would normally have accompanied a long syllable.³⁸ The suffix *-ia* would connote the verbal action of creating a ἄρ(η)μος or 'joined-thing', or be the concrete agent of that action, rather than or as well as the abstract quality or condition of being joined; this is how ἄρμονία is used in construction contexts from Homer onwards (cf. 4.19-21).³⁹ An alternate derivation from an adjectival form ἄρμων is also possible, where ἄρμονία is the agent of the adjectival state. The name Harmonides ("Son of a joiner"), presumes the proper or professional name Ἄρμων, -ονος, with this

³⁶ See Buck/Petersen (1945), 469.

³⁷ Cf. Ventris/Chadwick (1973), 90f.: "It is most revealing to find that words we had thought to be post-classical are of such venerable antiquity; it should never be assumed that absence from the literary record implies absence from the vocabulary".

³⁸ On which see Wright (1912), 162 (322); cf. 74 (119).

³⁹ Aristid. Quint. 2.6 (102.2-3) πάντα γὰρ γίνεσθαι διὰ τῆς εἰς ἓν ἄρμονίας συνεχόμενα ("For all things are held together through the joining [ἄρμονία] into one").

same suffix denoting agent;⁴⁰ a similar form is attested in βητάρμων, “step-joiners”, and could have existed alongside the attested *ar(h)mḥ*: cf. γνώμων/γνώμα, μνήμων/μνήμα.

40 Wright (1912), 131 (273).

APPENDIX B
Cuneiform Texts

Nabnitu XXXII

column i

restored from U.3011 (=A) and N.4782 (=C)

	Sumerian	Akkadian	A	C	Translation
1	sa-di	qud-mu-tum ¹	+	-	front string
2	sa-uš	šá-mu-šu-um	+	-	next string
3	sa-3-sa-sig	šá-al-šu qa-a[t-nu]	+	-	third-thin string
4	sa-4-tur	A-ba-nu-ú	+	-	Sumerian: fourth-small; Akkadian: Ea-Creator
5	sa-di- [*] 5	ha-am-[šu]	+	-	fifth string
6	sa-4-a-ga-gul	ri-bi úh-ri-i[m]	+	-	fourth-of-the-back string
7	sa-3-a-ga-gul	šal-ši úh-ri-im	+	-	third-of-the-back string
8	sa-2-a-ga-gul	ši-ni úh-ri-im	+	+	second-of-the-back string
9	[sa-1]-a-ga-gul-la	úh-ru-um	+	+	back string
10	[9]-sa ¹ -a	9 pi-it-nu	+	-	9 strings
11	[sa]-du-a!	pi-is-mu	+	-	the turnings
12	[sa-si-s]á	i-ša-ar-[tum]	+	+	normal tuning
13	[sa-šú?-si-s]á	st-ši-ip i-š[a-ar-ti-im]	+	+	overturn of normal
14	[sa]-x ¹	ki-it-mu-[um]	+	+	closed tuning
15	[sa-šú? .]-x ¹	st-ši-ip ki-[it-mi-im]	+	+	overturn of closed
16	[sa-gi-g]íd	en-bu-bu-[um]	+	+	reed-pipe tuning
17	[sa-šú?-gi-g]íd	st-ši-ip e[n-bu-bi-im]	+	+	overturn of reed-pipe
18	[sa-x]	[p]i-[tum]	-	+	open tuning
19	[sa-šú?-x]	[sthip pīim]	-	-	overturn of open
20	[sa-šub-murub ₄]	[nīd qablim]	-	-	fall-of-middle tuning
21	[sa-šú?-šub-murub ₄]	[sthip nīd qablim]	-	-	overturn of fall-of-middle
22	[sa-x-gaba-ri]	[nīs gabrīm]	-	-	rise-of-the-duplicate tuning
23	[sa-šú?-x-gaba-ri]	[sthip nīs gabrīm]	-	-	overturn of rise-of-the-duplicate
24	[sa-murub ₄]	[qablītum]	-	-	middle tuning
25	[sa-šú?-murub ₄]	[sthip qablītum]	-	-	overturn of middle

4 (2) A-[DÜ] Finkel (1982) (A-ba-nu-ú inadvertently left out of Gurney's handcopy in UET VII 126, cf. Kilmer/Crocker (1984) p. 82 n. 1 • 5 (1) A: sa-di-4 • 8 (1) C: [. . . .] (2) C: š[il]-ni ú[h]-. ú[h]-re-em] Shaffer (1981) • 9 (1) A: [. .]-a-ga-gul-la. C: [. . . .]-la. (2) C: úh-ru-[.] • 10-11 omitted C • 10 (1) A: [.]-sa¹-a. • 11 (1) A: [.]-x-y. [sa]-du-a! Kilmer (cf. BM 65217 + 66616.14a, Kilmer (1984); [sa]-du-NÍG Finkel (1982) • 12 (1) A: [. . -s]á Finkel (1982)?; Kilmer/Crocker (1984). C: [. .]-sá Shaffer (1981). [sa-si-s]á Finkel (1982) (cf. BM 65217 + 66616.15a, Kilmer (1984)). (2) A: i-ša-ar-ti. C: i-ša-ar-[.]. i-ša-ar-[tum] Shaffer (1981); Kilmer/Crocker (1984) • 13 (1) A: broken. C: [. . .]-x¹ Finkel (1982) (x: final vertical after break); [. . . -s]á Kilmer/Crocker (1984). [sa-šú?-si-s]á Kilmer (1994) (šú = sihip throughout?); [sa-x-si-s]á (Kilmer/Crocker 1984)(x = sihip throughout). (2) A: [s]i-š[il]-ip¹ i-šar-tum (collated with C by Shaffer (1981)); š[il]-ip instead throughout? Kilmer/Crocker (1984) n.5. C: st-ši-ip i-š[a-ar-ti-im] Shaffer (1981); Kilmer/Crocker (1984); st-ši-ip instead throughout? Kilmer/Crocker (1984) n.5. Finkel (1982): st-ši-ip i-šar-tum • 14 (1) A: broken. C: [. . .]-x¹ Finkel (1982) (x: tip of final vertical); [. -š]ú Kilmer/Crocker 1984. [sa-šú?]ú? Kilmer/Crocker (1984)(šú = kitmu). [sa]-x¹ Kilmer (1994)(x = kitmu). (2) A: [kl]-it-mu. C: ki-it-m[u] Finkel (1982); ki-it-mu-[um] Shaffer (1981); Kilmer/Crocker (1984) • 15 (1) A: broken. C: [. . .]-x¹ Finkel (1982); [. . . š]ú? Kilmer/Crocker (1984). [sa-šú?- .]-x¹ Kilmer (1994)(x = kitmim); [sa-x- . -š]ú? Kilmer/Crocker (1984)(x = sihip, šú = kitmim). (2) A: k[il]-it-mu. C: st-ši-ip ki-[.]. ki-it-[it-mi-im] Shaffer (1981). Finkel (1982): st-ši-ip ki-it-mu • 16 (1) A: broken. C: [. . .]-x¹ Finkel (1982)(x: tip of final vertical); [. . . -g]íd Kilmer/Crocker (1984). [sa-gi-g]íd Kilmer/Crocker 1984. (2) A:]-um. [em-bu-bu]-um Kilmer/Crocker (1984). C: en-bu-bu-[.]. en-bu-bu-[um] Shaffer (1981) • 17 (1) A: broken. C:[. . . .]. [sa-šú?-gi-g]íd Kilmer (1994); [sa-x-gi-g]íd Kilmer/Crocker (1984). (2) A: -u]m. [si-ši-ip em-bu-bu-u]m Kilmer/Crocker (1984). C: [s]i-ši-ip e[n- .]. [s]i-ši-ip e[n-bu-bi-i]m Shaffer (1981); Kilmer/Crocker (1984); [s]i-ši-ip e[n-bu-bu-u]m Finkel (1982) • 18 (1) A: broken. C:[. . . .]. [sa-x] Kilmer/Crocker (1984)(x = pīum. (2) A: broken. [pi-tum] Kilmer/Crocker (1984). C:[x¹]-[.] Finkel (1982)(x: illegible trace); [p]i-[.] Kilmer/Crocker (1984). [p]i-[tum] Kilmer/Crocker (1984). • 19ff. A and C both broken. • 19 (1) [sa-šú?-x] Kilmer (1994)(x = pīim); [sa-x-y] Kilmer/Crocker (1984)(y = pīim). (2) [sihip pīim] Kilmer/Crocker (1984) • 20 (1) [sa-šub-murub₄] Kilmer/Crocker (1984) (2) [nīd qablim] ibid. • 21 (1) [sa-šú?-šub-murub₄] Kilmer (1994); [sa-x-šub-murub₄] Kilmer/Crocker (1984). (2) [sihip nīd qablim] ibid. • 22 (1) [sa-x-gaba-ri] ibid. (x = nīs). (2) [nīs gabrīm] • 23 (1) [sa-šú?-(x?)]-gaba-ri] Kilmer (1994)(x = nīs omitted? cf. following); [sa-x-y-gaba-ri] Kilmer/Crocker (1984) (2) [sihip nīs gabrīm] ibid. • 24 (1) [sa-murub₄] ibid. (2) [qablītum] ibid. • 25 (1) [sa-šú?-murub₄] Kilmer (1994); [sa-x-murub₄] Kilmer/Crocker (1984). (2) [sihip qablītum] ibid.

Translation

1a.	1, 5	sa niš gab ri (= niš gab ri)	1, 5	"Rise-of-the-Duplicate" dyad
1b.	7, 5	sa še-e-ru]	7, 5	"Song" dyad
1c.	2, 6	sa i-šar-tum]	2, 6	"Normal" dyad
1d.	1, 6	sa šal-šá-tum]	1, 6	"Third" dyad
11.	3, 7	sa em-bu-bu]	3, 7	"Reed-pipe" dyad
12.	2, 7	sa 4-tu (= rebūtu)]	2, 7	"Fourth" dyad
13.	4, 1	sa šub murub, (= nīd qabli)]	4, 1	"Fall-of-the-Middle" dyad
14.	1, 3	sa giš.šub.ba (= isqu)]	1, 3	"Throwstick/Lot" dyad
15.	5, 2	sa murub, -tu (= qabliu)]	5, 2	"Middle" dyad
6.	12, 4	sa ti-tur murub, -tum (= titur qabliu)]	2, 4	"Bridge of the Middle" dyad
7.	6, 3	sa ki-mu	6, 3	"Closed" dyad
8.	3, 5*	sa ti-tur i-šar-tum	3, 5	"Bridge-of-Normal" dyad
9.	7, 4	sa pi-tum*	7, 4	"Open" dyad
10.	4, 6	sa sir-du	4, 6	"Lament" dyad
11.	sa qud-mu-ú	1, 5 sa niš gab ri (= niš gab ri)		"Rise-of-the-Duplicate" dyad
12.	sa 3 uḫ-ri	7, 5 sa še-e-ru		"Song" dyad
13.	ša šá-ge ₆	2, 6 sa i-šar-tum		"Normal" dyad
14.	sa qud-mu-ú	1, 6 šal-šá-tum		"Third" dyad
15.	sa 3-šú sig	3, 7* sa em-bu-bu		"Reed-pipe" dyad
16.	sa šá-ge ₆	2, 7* sa 4-tu (= rebūtu)		"Fourth" dyad
17.	sa ḫé-a-dū	4, 1 sa šub murub, (= nīd qabli)		"Fall-of-Middle" dyad
18.	sa qud-mu-ú	1, 3 sa giš.šub.ba (= isqu)		"Throwstick/Lot" dyad
19.	sa 5-šú	5, 2 sa murub, -tu (= qabliu)]		"Middle" dyad
20.	sa šá-ge ₆	2, 4 sa ti-tur murub, -tu (= titur qabliu)]		"Bridge-of-Middle" dyad
21.	sa 4 uḫ-ri	6, 3 sa ki-mu]		"Closed" dyad
22.	sa 3-šú sig	31, [5 sa ti-tur i-šar-tum]		"Bridge-of-Normal" dyad
23.	sa 3-šú uḫ-ri	7, 4 sa pi-tum]		"Open" dyad
24.	sa ḫé-a-dū	4, 6 sa sir-du]		"Lament" dyad

a-5 restored from 11-19 Kilmer (1965) 265-266 • 6, 12, 14, 15 a x i-tum Kilmer (1960); restored from 20, collated Kilmer (1965) • 7 4, 3 Kilmer (1960) 6, 3 restored from 21, collated (Kilmer 1965). • 8 3, 6 sa ti-x i-šar-tum Kilmer (1960); emended to 3, 5* from line 22 Kilmer (1965); ti-x read as ti-tur by analogy with 6, 20? Kilmer (1965). cf. Hh6.5 tit(m) isarte • 9 sa ti-tum Kilmer (1960); emended to pi-tum from VAT 10101 viii.48 pi-i-te Kilmer (1965) 266 n.41; cf. Güterbock (1970) 49 m. 6 and 8 • 10 sa muš-šum Kilmer (1960); sa muš-du, collated Kilmer (1965); ušir-du Güterbock (1970) 49 n.7, cf. Hh6.6 zúte, sir-du Kilmer (1984) 70 n.2 • 11 man-ga-ri, "reed basket" Kilmer (1960); niš gab ri Kilmer (1965) 266 n.43, cf. VAT 10101 viii.50 ni-is* gab ri • 12 sa sar nišgin Kilmer (1960); sa še-e-ru Kilmer (1965) 266 n.44, cf. VAT 10101 viii.19 zamar še-e-ri, Hh6.8 šapri Güterbock (1970) 48 n.5 • 13 šá-ge₆ = ša-muša, cf. U.3011.2 Kilmer (1965) 266 n.45 • 15 text 3, 4; emended to 3, 7* Kilmer (1960) 300 n.4 • 16 text 2, 4; emended to 2, 7* Kilmer (1965) 265-266 • 17 sa nim murub Kilmer (1960); sa nim murub, Kilmer (1965); šub murub, Güterbock (1970) 49 n.4; Kilmmel (1970) 253 n.2, 263, von Soden AHw s.v. nādu(m), 9; cf. Kilmer (1965) 266 n.49 • 18 giš.nim.ma Kilmer (1960, 1965); giš.šub.ba Güterbock (1970) 49 n. 5; Kilmmel (1970) 253 n.2, 263, cf. Kilmer (1971) 144 n.64 • 19 sa mīn 3-šú Kilmer (1960); sa 5-šú Kilmer (1965) 266 n.50 • 20 sa i x i murub-tú Kilmer (1960); sa i-tur murub, -tu Kilmer (1960), cf. line 6 • 21-24 restored from 7-10 Kilmer (1965) 265-266 • rest of column destroyed

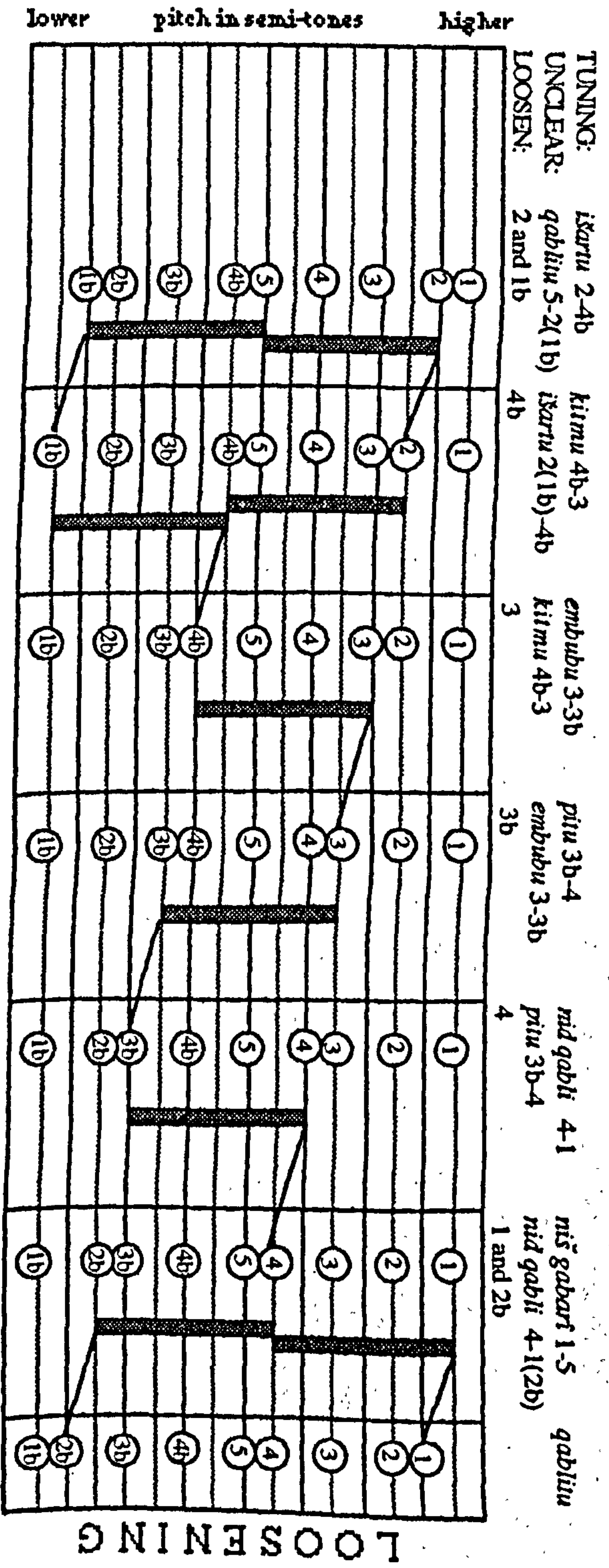
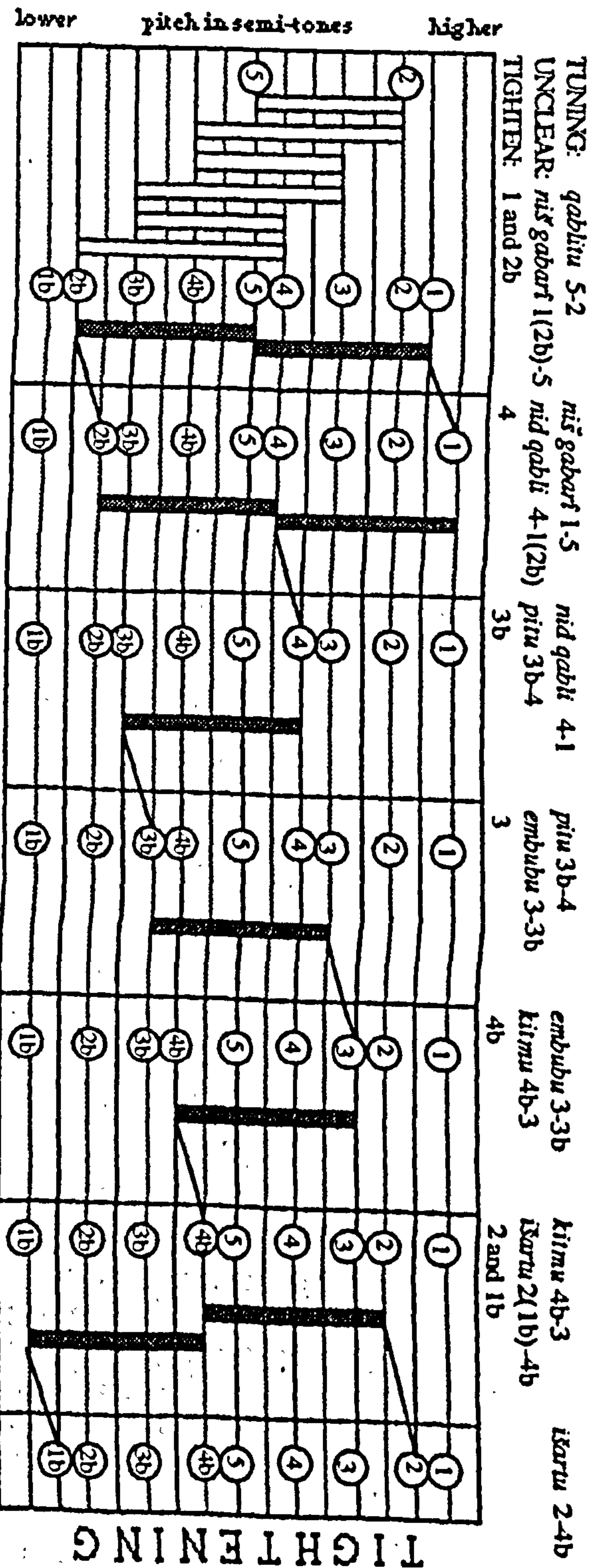
1. [e-e]m-b[u-bu-um la za-ku]
2. ša-al-š[a-am qá-aí-na-am tu-na-sà-ah-ma]
3. e-em-bu-bu-u[m is-sa₃ha-ap]
4. šum-ma ^uz[à.mí e-em-bu-bu-um-ma]
5. ki-it-mu-um [la za-ku]
6. re-bi úh-ri-im [tu-na-sà-ah-ma]
7. ki-it-mu-um i[s-sa₃ha-ap]
8. šum-ma ^uzà.mí k[i-ít-mu-um-ma]
9. i-šar-tum la za-[ka-aí]
10. ša-mu-ša-am ù úh-ri-a-a[m tu-na-sà-ah-ma]
11. i-šar-tum is-sa₃[ha-ap]
12. nu-su-ḥ[u-um]
13. šum-ma ^uzà.mí i-sar-t[um-ma]
14. qá-ab-li-ta-am ta-al-pu-[ut]
15. ša-mu-ša-am ù úh-ri-a-am
16. [^uzà.mí ki-it-m[u-um]
17. [šum]-ma ^uzà.mí ki-it-m[u-um-ma]
18. [i-šar-ta-am la za-ku-ta-am t[a-al-pu-ut]
19. [re-bi] úh-ri-im te-ni-e! [-ma]
20. [^uzà.mí e-em-bu-bu-um]

Translation (with restorations)

- | | | |
|------|---|---|
| [a. | If the lyre is in <i>qabli-tu</i> (tuning) |] |
| [b. | (the interval) <i>nīs gabarī</i> is not clear; |] |
| [c. | but tighten the front-string and the second-back-string |] |
| [d. | and <i>nīs gabarī</i> (tuning) turns over. |] |
| [e. | If the lyre is in <i>nīs gabarī</i> (tuning) |] |
| [f. | (the interval) <i>nīd qabli</i> is not clear; |] |
| [g. | but tighten the fourth-string |] |
| [h. | and <i>nīd qabli</i> (tuning) turns over. |] |
| [i. | If the lyre is in <i>nīd qabli</i> (tuning) |] |
| [j. | (the interval) <i>pītu</i> is not clear; |] |
| [k. | but tighten the third-back-string |] |
| [l. | and <i>pītu</i> (tuning) turns over. |] |
| [m. | If the lyre is in <i>pītu</i> (tuning) |] |
| 1. | (the interval) <i>embubu</i> is not clear; | |
| 2. | but tighten the third-thin-string | |
| 3. | and <i>embubu</i> (tuning) turns over. | |
| 4. | If the lyre is in <i>embubu</i> (tuning) | |
| 5. | (the interval) <i>kitmu</i> is not clear; | |
| 6. | but tighten the fourth-back-string | |
| 7. | and <i>kitmu</i> (tuning) turns over. | |
| 8. | If the lyre is in <i>kitmu</i> (tuning) | |
| 9. | (the interval) <i>išartu</i> is not clear; | |
| 10. | but tighten the second- and the back-string | |
| 11. | and <i>išartu</i> (tuning) turns over. | |
| 12. | — TIGHTENING — | |
| 13. | If the lyre is in <i>išartu</i> (tuning) | |
| 14. | you play (the interval) <i>qabliṭu</i> , | |
| 15. | loosen the second- and the back-string, | |
| 16. | and the lyre is in <i>kitmu</i> (tuning). | |
| 17. | If the lyre is in <i>kitmu</i> (tuning) | |
| 18. | you play (the interval) <i>išartu</i> , | |
| 19. | loosen the fourth-back-string, | |
| 20. | and the lyre is in <i>embubu</i> (tuning). | |
| [aa. | If the lyre is in <i>embubu</i> (tuning), |] |
| [bb. | you play (the interval) <i>kitmu</i> , |] |
| [cc. | loosen the third-thin-string, |] |
| [dd. | and the lyre is in <i>pītu</i> (tuning). |] |
| [ee. | If the lyre is in <i>pītu</i> (tuning), |] |
| [ff. | you play (the interval) <i>embubu</i> , |] |
| [gg. | loosen the third-back-string, |] |
| [hh. | and the lyre is in <i>nīd qabli</i> (tuning). |] |
| [ii. | If the lyre is in <i>nīd qabli</i> (tuning) |] |
| [jj. | you play (the interval) <i>pītu</i> , |] |
| [kk. | loosen Ea-Creator, |] |
| [ll. | and the lyre is in <i>nīs gabarī</i> (tuning). |] |
| [mm. | If the lyre is in <i>nīs gabarī</i> (tuning) |] |
| [nn. | you play (the interval) <i>nīd qabli</i> , |] |
| [oo. | loosen the front-string and the second-back-string |] |
| [pp. | and the lyre is in <i>qabliṭu</i> (tuning). |] |
| [qq. | — LOOSENING — |] |

a-m restored from 1-11 (cf. Kilmer/Crocker/Brown (1976) fig. 8) • 2 [tu-na-sà-ah-ma] Krispijn (1990) 15; cf. Gurney (1994) 101-102; [te-ni-ma] Gurney (1968) • 3 [is-sa₃ha-ap] after Shaffer (1981), [iz-za-ku] Kummel (1970) 255 n.3; [iz/š-z/ša- . .] Gurney (1968); [iz-za-az], "will stand", ibid. • 6 [tu-na-sà-ah-ma] Krispijn (1990), Gurney (1994) ibid.; [te-ni-ma] Gurney (1968) • 7 i[s-sa₃ha-ap] Shaffer (1981); i[z-za-ku] Kummel (1970); i[z/š-z/ša- . .] Gurney (1968); i[z-za-az] ibid. 82 • 10 [tu-na-sà-ah-ma] Krispijn (1990), Gurney (1994) ibid.; [te-ni-ma] Gurney (1968) • 11 ; is-sa₃[ha-ap] Shaffer (1981) 82; iz-za-[ku] Kummel (1970); iz/š-x/ša-[. .] Gurney (1968); iz-za-[az], ibid. • 12 nu-su-ḥ[u-um] Krispijn (1990), Gurney (1994) ibid.; nu su Gurney (1968); nu su x[?] Kummel (1970); [x?] nu.su [y] Kilmer (1971), 140 n.45; [sa] nu.su.s[u] Kilmer ibid.; nu.su(=sù).ud Kilmer ibid., cf. Crocker (1978) 101 n.9 • 14 ta-al-pu-[ut] Gurney (1968), cf. Kummel (1970) 256 n.1, Kilmer (1971) 140 n. 48 • 15 te-[ni-e-ma] Krispijn (1990), cf. Gurney (1994) ibid.; te-[ni-ma] Gurney (1968) • 16 ki-it-mu-[um] Gurney (1994); ki-it-mu-[um-ma] Gurney (1968) • 19 te-ni-e[-ma] Krispijn (1990), cf. Gurney (1994) ibid.; te-n[i]-m[a] Gurney (1968) • 20 e-em-bu-bu-um Gurney (1994); e-em-bu-bu-um-ma Gurney (1968) • aa-qq restored from 12-20; for qq cf. Gurney (with Krispijn) (1994) 102.

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BIBLIOGRAPHY

- Ahl, F., "Pindar and the Sphinx: Celtic Polyphony and Greek Music", in R. W. Wallace/B. MacLachlan, edd., *Harmonia Mundi: Musica e Filosofia nell' Antichità* (Roma 1991), 131-150.
- Aign, B., *Die Musikinstrumente des ägäischen Raumes bis um 700 vor Christus* (Frankfurt am Main, 1963).
- Allen, T. W., *Homer: The Origins and the Transmission* (Oxford, 1924).
- Allen, T. W./Halliday, W. R./Sikes, E. E., *The Homeric Hymns*, second ed. (Oxford, 1936).
- Anderson, W. D., *Ethos and Education in Greek Music* (Cambridge Mass., 1966).
- *Music and Musicians in Ancient Greece* (Ithaca, and London, 1994).
- Anonymous, "Der orphische Papyrus von Derveni", *Zeitschrift für Papyrologie und Epigraphik* 47 (1982), after p. 300.
- Aravantinos, V., "New Archaeological and Archival Discoveries at Mycenaean Thebes", *Bulletin of the Institute of Classical Studies* 41 (1996), 135f.
- Astour, M. C., *Hellenosemitica: An Ethnic and Cultural Study in West Semitic Impact on Mycenaean Greece* (Leiden, 1967).
- Aubet, M., *The Phoenicians and the West: Politics, colonies and trade* (Cambridge, 1993).
- Barker, A., *Greek Musical Writings*. 2 volumes (Cambridge, 1984-1989).
- "Innovations of Lysander the Kitharist", *Classical Quarterly* n.s. 32 (1982a), 266-269.
- "Hoi Kaloumenoi Harmonikoi: The Predecessors of Aristoxenus", *Proceedings of the Cambridge Philological Society* 24 (1978), 1-21.
- Bartoněk, A., "Mycenaean Koine Reconsidered", in Palmer/Chadwick (1966), 95-103.
- Beaton, R., "Modes and Roads: Factors of Change and Continuity in Greek Musical Tradition", *The Annual of the British School at Athens* 75 (1980), 1-11.
- Bélis, A., *Aristoxène de Tarente et Aristote: Le Traité d'harmonique* (Paris, 1986).
- Benveniste, E., *Indo-European Language and Society* (London 1973).
- Bhattacharya, S., *Ethnomusicology and India* (Calcutta, 1968).
- Bielohlawek, K., "ΜΕΛΠΕΣΘΑΙ und ΜΟΛΠΗ", *Wiener Studien* (1924-5), 1-17 and 125-43.
- Blümer, H., *Technologie und Terminologie der Gewerbe und Künste bei Griechen und Römern* (Leipzig, 1884).
- Brancacci, A., "Alcidamante e PHibeh 13 'De musica': Musica della retorica e retorica della musica", in Francesco Adorna (ed.), *Aristoxenica, Menandrea, fragmenta philosophica*. Academia toscana di scienze e lettere, Studi xci (1988), 61-84.
- Braun, T. F. R. G., "The Greeks in the Near East", in J. Boardman/N. G. L. Hammond (eds.), *The Cambridge Ancient History. Volume III Part 3: The Expansion of the Greek World, Eighth to Sixth Centuries B.C* (Cambridge, 1982), 1-31.

- Brown, N. O., *Life Against Death: The Psychoanalytical Meaning of History* (New York, 1959).
- Brown, W. N., "Duty as Truth in the *Rig Veda*", in J. Ensink/P. Gaeffke (ed.), *India Maior* (Leiden, 1972).
- Browning, R., "A Byzantine Treatise on Tragedy", in L. Varcl/R. F. Willetts (ed.), *Γερασ: Studies Presented to George Thomson* (Prague, 1963), 67-81.
- Buck, C. D./Petersen, W., *A Reverse Index of Greek Nouns and Adjectives* (Chicago, 1945).
- Burkert, W., *The Orientalizing Epoch* (Cambridge Mass., 1992).
- Burkert, W., *Lore and Science in Ancient Pythagoreanism* (Cambridge Mass., 1972).
- Burkert, W., "Das Lied von Ares und Aphrodite", *Rheinisches Museum für Philologie* (1960), 130-44.
- Burrow, T., *The Sanskrit Language* (London, 1973).
- Campbell, D., Review of Gostoli (1990), *Gnomon* 65 (1993), 70f.
- Càssola, F., *Inni Omerici* (Milan, 1975).
- Chadwick, J., *Lexicographica Graeca: Contributions to the Lexicography of Ancient Greek* (Oxford, 1996).
- "Who Were the Dorians?", *La Parola del Passato* 31 (1976), 103-117.
- "The Greek Dialects and Greek Pre-history", *Greece & Rome* N.S. 3 (1956), 38-50.
- Chailley, J., "Nicomaque, Aristote et Terpandre devant la transformation de l'heptacorde grec en octocorde," *Yuval* 1 (1968), 132-154.
- Chantraine, P., *Dictionnaire Etymologique de la Langue Grecque* (Paris, 1968).
- Cole, A. T., "The Saturnian Verse", *Yale Classical Studies* 21 (1969), 3-73.
- Coover, G./Franklin, J. C., "Dictionaries & Encyclopedias of music", in S. Sadie (ed.), *The New Grove Dictionary of Music and Musicians*, second edition (London, 2001).
- Crocker, R. L., "Remarks on the Tuning Text UET VII 74 (U. 7/80), *Orientalia* 47 (1978), 99-104.
- Culican, W., "Phoenicia and Phoneician colonization", in J. Boardman et al. (ed.), *The Cambridge Ancient History. Volume III Part 2: The Assyrian and Babylonian Empires and other States of the Near East, from the Eighth to the Sixth Centuries B.C.* (Cambridge, 1991), 162-193.
- D'Angour, A., *The Dynamics of Innovation: Newness ad Novelty in the Athens of Aristophanes*, Diss. University College London (1998).
- Deubner, L., "Terpander und die siebensaitige Leier", *Philologische Wochenschrift* 50 (1930), 1566-67.
- "Die viersaitige Leier", *Athenische Mitteilungen* 54 (1929), 194-200.
- Deva, B. C., *Indian Music* (New Delhi, 1974).
- Dietrich, M./Loretz, O., "Kollationen zum Musiktext aus Ugarit", *Ugarit-Forschungen* vii (1975), 521f.

- Dilts, M. R., *Heraclidis Lembi Excerpta Politiarum*. Greek, Roman and Byzantine Monograph 5 (Durham, North Carolina, 1971).
- Dodds, E. R., *The Greeks and the Irrational*, (Berkeley and Los Angeles, 1951).
- Dover, K. J., *Theocritus: Select Poems* (Basingstoke and London, 1971).
- Duchesne-Guillemin, M., "Sur la restitution de la musique hourrite", *Revue de musicologie*, lxvi (1980), 5-26.
- "Déchiffrement de la musique babylonienne", *Academia dei Lincei, Quaderno* 236 (Rome, 1977).
- "Les Problèmes de la Notation hourrite", *Revue d'Assyriologie* 69 (1975), 159-173.
- "La Harpe à Plectre iranienne: son Origine et sa Diffusion", *Journal of Near Eastern Studies* 28 (1969b), 109-115.
- "La Theorie babylonienne des Métaboles musicales", *Revue de Musicologie* (1969a), 55.3-11.
- "Survivance orientale dans la designation des cordes de la lyre en Grèce?", *Syria* 44 (1967), 233-246.
- "A l'Aube de la Théorie Musicale: Concordance de trois tablettes babyloniennes", *Revue de Musicologie* 52 (1966), 147-162.
- "Note complémentaire sur la Découverte de la Gamme babylonienne", in *Studies in Honor of Benno Landsberger* (Chicago, 1965), 268-272.
- "Decouverte d'une Gamme Babylonienne", *Revue de Musique* 49 (1963), 3-17.
- Düring, I., Review of F. Lasserre (ed.) *Plutarch de la Musique*, *Gnomon* 27 (1955), 431-6.
- Ebeling, E., *Keilschrifttexte aus Assur religiösen Inhalts* (Leipzig, 1919).
- Edwards, R. B., *Kadmos the Phoenician: a Study in Greek Legends of the Mycenaean Age* (Amsterdam, 1979).
- Eliade, M., *Yoga: Immortality and Freedom* (London, 1958).
- *Le Chamanisme et les techniques archaïques de l'extase* (Paris, 1951).
- Erbse, H., *Untersuchungen zu den attizistischen Lexica*. *Abhandlungen der deutschen Akademie der Wissenschaften zu Berlin* (Berlin, 1950).
- Farmer, H. G., "The Music of Ancient Mesopotamia", in E. Wellesz (ed.), *New Oxford History of Music. Vol. 1: Ancient and Oriental Music* (London, 1957), 228-254.
- Finkel, I. L./Civil, M. (ed.), *Materials for the Sumerian Lexicon* 16 (Rome, 1982)
- Finkelberg, M., "Is ΚΛΕΟΣ ΑΦΘΙΤΟΝ a Homeric Formula?", *Classical Quarterly* 36 (1986), 1-5.
- Fleischhauer, G., *Etrurien und Rom*, vol. 2.5 of H. Besseler/M. Schneider (eds.) *Musikgeschichte in Bildern* (Leipzig, 1964)
- Foley, J. M., *Homer's Traditional Art* (University Park, Penn., 1999).
- Fox-Strangways, A. H., *The Music of Hindostan* (Oxford, 1914).

- Franklin, J. C., "Musical Syncretism and the Greek Orientalizing Period", forthcoming in the proceedings of the Tenth International Symposium of the Study Group on Music Archaeology (Berlin, 2002).
- Frankfort, H./Franfort, H. A./Wilson, J. A./Jacobsen, T./Irwin, W. A., *The Intellectual Adventure of Ancient Man* (Chicago, 1946).
- Frisk, H., *Griechisches Etymologisches Wörterbuch* (Heidelberg, 1960).
- Gasparov, M. L., *A History of Indo-European Versification* (Oxford, 1996).
- Gemoll, A., *Die Homerischen Hymnen* (Leipzig, 1886).
- Gevaert, F. A., *Histoire et théorie de la musique de l'antiquité*. 2 vols. (Ghent, 1875-81).
- Ghosh, M., "The Date of the Natyasastra", *Journal of the Department of Letters, University of Calcutta* (1934).
- Godwin, J., *Harmonies of Heaven and Earth: The Spiritual Dimension of Music from Antiquity to the Avant-Garde* (London, 1987).
- Gombosi, O. J., "New Light on Ancient Greek Music", in *Papers Read at the International Congress of Musicology, 1939* (New York, 1944), 168-183.
- *Tonarten und Stimmungen der antiken Music* (Copenhagen, 1939).
- Gonda, J., *Die Religionen Indiens. Vol.1: Veda und älterer Hinduismus* (Stuttgart, 1960).
- Gostoli, A., *Terpandro: Introduzione, testimonianze, testo critico, traduzione e commento*, (Rome, 1990).
- "Terpandro e la funzione etico-politica della musica", in B. Gentili/R. Prestagostini (ed.), *La Musica in Grecia* (Rome, 1988), 232-237.
- Grieser, H., *Nomos: Ein Beitrag zur griechischen Musikgeschichte* (Heidelberg, 1937).
- Guillemin, M./Duchesne, J., "Sur l'origine asiatique de la cithare grecque", *Antiquité classique* 4 (1935), 117-124.
- Gurney, O.R., "Babylonian Music Again", *Iraq* 56 (1994), 101-106.
- *Ur Excavation Texts VII* (British Museum, 1974).
- "An Old Babylonian Treatise of the Tuning of the Harp", *Iraq* 30 (1968), 229-33.
- Gurney, O. R./West, M. L., "Mesopotamian Tonal Systems: A Reply", *Iraq* 60 (1998), 223-227.
- Güterbock, H. G., "Musical Notation in Ugarit", *Revue d'Assyriologie* 64 (1970), 45-52.
- Hagel, S., *Modulation in altgriechischer Musik: Antike Melodien im Licht antiker Musiktheorie* (Frankfurt am Main, 2000).
- Hawkins, Sir John, *A General History of the Science and Practice of Music*, three volumes, 1776 (repr. London, 1875).
- Held, M., "A Faithful Lover in an Old Babylonian Dialogue", *Journal of Cuneiform Studies* 15 (1961), 1-26.
- Helmholtz, H. L. F., *The Sensations of Tone*, third edition (London and New York, 1895).

- Henderson, I. "Ancient Greek Music" in E. Wellesz (ed.), *New Oxford History of Music. Vol. 1: Ancient and Oriental Music* (London, 1957), 336-397.
- Herwerden, H., *Lexicon Graecum suppletorium et dialectum*, vol. 1 (Leiden, 1910)
- Heubeck, A., "Zur dialektologischen Einordnung des Mykenischen", *Glotta* 39 (1961), 159-178.
- Heubeck, A./West, S./Hainsworth, J. B., *A Commentary on Homer's Odyssey. Volume 1: Introduction and Books i-viii* (Oxford, 1988).
- Hooker, J. T., *Mycenaean Greece* (London, 1976).
- Horrocks, G. C., "Homer's Dialect", in Morris/Powell (1997).
- "The Antiquity of the Greek Epic Tradition: Some New Evidence", *Proceedings of the Cambridge Philological Society* 206 (1980), 1-11.
- Huffman, C. A., *Philolaus of Croton* (Cambridge, 1993).
- Hunter, R., *Theocritus and the Archaeology of Greek Poetry* (Cambridge, 1996).
- Jairazbhoy, N. A., *The Rags of North Indian Music* (London, 1971).
- Jakobson, R., "Studies in Comparative Slavic Metrics", *Oxford Slavonic Papers* 3 (1952), 21-66.
- Jan, K. von, *Musici scriptores Graeci: Aristoteles, Euclides, Nicomachus, Bacchius, Gaudentius, Alypius* (Leipzig, 1895).
- Janko, R., *Philodemus On Poems* (Oxford, 2000).
- "The Physicist as Hierophant: Aristophanes, Socrates and the Authorship of the Derveni Papyrus", *Zeitschrift für Papyrologie und Epigraphik* 118 (1997), 61-94.
- *The Iliad: A Commentary, vol. 4: books 13-16* (Cambridge 1992).
- *Homer, Hesiod and the Hymns* (Cambridge, 1982).
- Janssen, T. H., *Timotheus Persae: A Commentary*. Classical and Byzantine Monographs, ed. G. Giangrande and H. White, vol. 6 (Amsterdam, 1984).
- Karageorghis, V., "Cyprus", in J. Boardman/N. G. L. Hammond (ed.), *The Cambridge Ancient History. Volume III Part 3: The Expansion of the Greek World, Eighth to Sixth Centuries B.C.* (Cambridge 1982).
- Kent, R. G., *Old Persian* (New Haven, 1953).
- Kern, O., *Orphicorum Fragmenta* (Berlin, 1922).
- Kilmer, A. D., "Musik. A. Philologisch" in *Reallexikon der Assyriologie und vorderasiatischen Archäologie* 8 (1994), 463-82.
- "A Music Tablet from Sippar (?): BM 65217 + 66616", *Iraq* 46 (1984), 69-80.
- "The Cult Song with Music from Ancient Ugarit: Another Interpretation", *Revue d'Assyriologie* 68 (1974), 69-82.
- "The Discovery of an Ancient Mesopotamian theory of music", *Proceedings of the American Philosophical Society* 115 (1971), 131-49.

- "The Strings of Musical Instruments: their Names, Numbers and Significance", in *Studies in Honor of Benno Landsberger* (Chicago, 1965), 261-268.
- "Two New Lists of Key Numbers for Mathematical Operations," *Orientalia* 39 (1960), 273-308.
- Kilmer, A. D./Civil, M., "Old Babylonian Musical Instructions Relating to Hymnody", *Journal of Cuneiform Studies* 38 (1986), 94-98.
- Kilmer, A. D./Crocker, R. L., "The Fragmentary Music Text from Nippur", *Iraq* 46 (1984), 81-85.
- Kilmer, A.D./Crocker, R. L./Brown, R. R., *Sounds from Silence: Recent Discoveries in Ancient Near Eastern Music* (Berkeley, 1976). Sound recording and text.
- Kirk, G. S., *Heraclitus the Cosmic Fragments* (Cambridge, 1954).
- Kirk, G. S./Raven, J. E./Schofield, M., *The Presocratic Philosophers* (Cambridge, 1983).
- Krispijn, Th. J. H., "Beitrage zur altorientalischen Musikforschung 1", *Akkadica* 70 (1990), 1-27.
- Kümmel, H. M., "Zur Stimmung der babylonischen Harfe", *Orientalia* 39 (1970), 252-263.
- Laks, A./Most, G. W. (ed.), *Studies on the Derveni Papyrus* (Oxford, 1997).
- Laloy, L., *Aristoxène de Tarente et la musique de l'antiquité* (Paris, 1904).
- Landsberger, B., *Zeitschrift für Assyriologie und verwandte Gebiete* 42 (1934), 155f.
- Laroche, E., "Notation Musicale", *Revue d'Assyriologie* 67 (1973), 124-129.
- "Documents en langue hourrite provenant de Ras Shamra II. Textes hourrites en cunéiformes syllabiques", *Ugaritica* 5 (1968), 462-496.
- *Le palais royal d'Ugarit* 3 (Paris, 1955).
- Lasserre, F., "Musica babilonese e musica greca", in B. Gentili/R. Prestagostini *La Musica in Grecia* (Rome, 1988), 72-83.
- *Plutarch de la Musique* (Rome, 1954).
- Lawergren, B./Gurney, O. R., "Sound Holes and Geometrical Figures: Clues to the Terminology of Ancient Mesopotamian Harps", *Iraq* 49 (1987), 37-52.
- Lefkowitz, M./Rogers, G. M. (ed.), *Black Athena Revisited* (Chapel Hill and London, 1996).
- Lejeune, M., *Phonetique historique mycénien et du grec ancien* (Paris, 1982).
- *Memoires de Philologie Mycénienne, Troisième Série* (1964-1968) (Rome, 1972)
- Lippman, E. A., *Musical Thought in Ancient Greece* (New York, 1964).
- Lord, A. B., *Epic Singers and Oral Tradition* (Ithaca and London, 1991).
- *The Singer of Tales* (Cambridge, Mass., 1960); reissued in 1980, 2000 with recordings from the Parry collection.
- "Homer and Other Epic Poetry", in Wace, A.J.B. and Stubbing, F.H., *A Companion to Homer* (London, 1962), 179-214.
- Lord, A. B./Bartók, B., *Serbo-Croatian Folk Songs* (New York, 1951).
- Lüders, H., *Varuna I-II* (Göttingen, 1951-9).

- Maas, M./Snyder, J., *Stringed Instruments of Ancient Greece* (New Haven and London, 1989).
- Maltese, E. V., *Sofocle Ichneutae: Introduzione, testo critico, interpretazione e commento*, in R. Pintaudi (ed.), *Papyrologica Florentina*, vol. 10 (Florence 1982).
- McDonald, W. A./Simpson, R. H., "Archaeological Exploration", in McDonald, W. A./Rapp, G. R. (ed.), *Minnesota Messenia Expedition: reconstructing a bronze age regional environment* (Minneapolis, 1972), 117-147.
- Macran, H. S., *The Harmonics of Aristoxenus* (Oxford, 1902).
- Mathiesen, T. J., *Apollo's Lyre: Greek Music and Music Theory in Antiquity and the Middle Ages* (Lincoln and London, 1999).
- Meiggs, R./Lewis, D., *A Selection of Greek Historical Inscriptions* (Oxford, 1969).
- Meillet, A., *Les Origines indo-européennes des mètres grecs* (Paris, 1923).
- Merriam, A. P., *The Anthropology of Music* (Evanston, Ill., 1964).
- Meyer, B. P., 'APMONIA: Bedeutungsgeschichte des Wortes von Homer bis Aristoteles, diss. Freiburg (Zürich, 1932).
- Morris, I./Powell, B., *A New Companion to Homer* (Leiden, 1997).
- Morris, S. P., *Daedalus and the Origins of Greek Art* (Princeton, 1992).
- Morrison, J. S./Coates, J. F., *The Athenian Trireme* (Cambridge, 1986).
- Murray, G., *The Classical Tradition in Poetry* (Oxford, 1927).
- Nagy, G., *Best of the Achaeans: Concepts of the Hero in Archaic Greek Art and Poetry* (Baltimore, 1979).
- *Comparative Studies in Greek and Indic Meter*, (Cambridge Mass., 1974).
- Nettl, B., *The Western Impact on World Music: Change, Adaptation, and Survival* (New York and London, 1985).
- "Some Aspects of the History of World Music in the Twentieth Century: Questions, Problems and Concepts", *Ethnomusicology* 32 (1978).
- *Theory and Method in Ethnomusicology* (New York, 1964).
- Palmer, L. R., *The Interpretation of Mycenaean Greek Texts* (Oxford, 1963).
- L. R. Palmer/J. Chadwick (ed.), *Proceedings of the Cambridge Colloquium on Mycenaean Studies* (Cambridge, 1966).
- Parry, M., *The Collected Papers of Milman Parry*, ed. Parry, A. (New York, Oxford, 1987).
- "Studies in the Epic Technique of Oral Verse-Making. II. The Homeric Language as the Language of an Oral Poetry", *Harvard Studies in Classical Philology* 43 (1932), 1-50.
- "Studies in the Epic Technique of Oral Verse-Making. I. Homer and Homeric Style", *Harvard Studies in Classical Philology* 41 (1930), 73-147.
- Parry, M./Lord, A. B./Bartók, B., *Serbocroatian Heroic Songs* (Cambridge and Belgrade, 1954).

- Pickard-Cambridge, A. W., *The Dramatic Festivals of Athens*, 2nd ed. rev. John Gould and D.M. Lewis (Oxford, 1968).
- *Dithyramb, Tragedy and Comedy* (Oxford, 1962)
- Picken, L., *Folk Musical Instruments of Turkey* (Oxford, 1975).
- Polomé, E. C. (ed.), *The Indo-Europeans in the Fourth and Third Millennia* (Ann Arbor, 1982).
- “Indo-European Culture, With Special Attention to Religion”, in Polomé (1982a), 156-172.
- Powell, B., *Homer and the Origin of the Greek Alphabet* (Cambridge, 1991).
- Propp, V. Y., *Morphology of the Folktale* (Austin and London, 1975).
- Prudhommeau, G., *La Danse Grecque Antique*, 2 volumes (Paris, 1965).
- Rankin, H. D., *Celts and the Classical World* (London, 1987).
- Risch, E., “Les différences dialectales dans le mycénien”, in Palmer/Chadwick (1966), 150-7.
- Roberts, H. H., “The Technique of Playing Ancient Greek Instruments of the Lyre Type”, in *Music and Civilization (British Museum Yearbook, 4)*, ed. T.C. Mitchell (1980), 43-76.
- Rocchi, M., *Kadmos e Harmonia: un matrimonio problematico* (Rome, 1989).
- Rocher, L., *The textual tradition of the Bharatiyanatyasastra: a philological assessment*, Wiener Zeitschrift für die Kunde des Morgenlandes (1981).
- Ruijgh, C. J., “Le traitement des sonantes voyelles dans les dialectes grecs et la position du mycénien”, *Mnemosyne* 14 (1961), 193-216.
- Sachs, C., *The Rise of Music in the Ancient World East and West* (New York, 1943). on evolution
- Salonen, A., *Die Möbel des alten Mesopotamien* (Helsinki, 1963).
- Scheltema, H. J., “De antiphonia”, *Mnemosyne* 60 (1932), 239-53.
- Schlesinger, K., *The Greek Aulos* (London, 1939).
- Schmitt, R., *Dichtung und Dichtersprache in indogermanischer Zeit* (Wiesbaden, 1967).
- Schmitt, R. (ed.), *Indogermanische Dichtersprache* (Darmstadt, 1968).
- Shaffer, A., “A New Musical Term in Ancient Mesopotamian Music”, *Iraq* 43 (1981), 79-83.
- Shipton, K. M. W., “Heraclitus fr. 10: A Musical Interpretation”, *Phronesis* 30 (1985), 111-130.
- Sloboda, J.A., *The Musical Mind: The Cognitive Psychology of Music* (Oxford, 1985).
- Smith, J. C./Kilmer, A. D., “Laying the Rough and Testing the Fine”, forthcoming.
- Smyth, H. W., *Greek Grammar* (Cambridge, Mass., 1920).
- Srinivasan, S. A., *On the Composition of the Natyasastra* (Reinbek, 1980).
- Stravinsky, I., *The Poetics of Music* (Cambridge, Mass., 1942).
- Szemerényi, O. J. L., *Introduction to Indo-European Linguistics* (Oxford, 1996),

- Tarlekar, G. H., *Studies in the Natyasastra* (Delhi, 1975).
- Thorp, J., "Aristoxenus and the Ethnoethical Modes", in Wallace/MacLachlan (1991), 54-65.
- Ventris, M./Chadwick, J., *Documents in Mycenaean Greek* (Cambridge, 1956); second edition by Chadwick, J. (1973).
- Visconti, A., *Aristosseno di Taranto: biografia e formazione spirituale* (Naples, 1999).
- Vitale, R. "La Musique suméro-akkadienne — Gamme et Notation musicale", *Ugarit-Forschungen* 14 (1982), 241-263.
- Wallace, R. W., "Damone di Oa ed i suoi successori: un'analisi delle fonti", in Wallace/MacLachlan (1991), 30-53.
- Wallace, R. W./MacLachlan, B. (ed.), *Harmonia Mundi: Musica e Filosofia nell' Antichità* (Roma 1991).
- Waterman, R. A., "African influence on American Negro music," in Sol Tax (ed.), *Acculturation in the Americas* (Chicago, 1952).
- Watkins, C., *How to Kill a Dragon: Aspects of Indo-European Poetics* (New York and Oxford, 1995).
- "Aspects of Indo-European Poetics", in Polomé (1982), 164-180.
- "Indo-European Metrics and Archaic Irish Verse", *Celtica* 6 (1963), 194-249.
- Webster, T. B. L. *The Greek Chorus* (London, 1970)
- Wegner, M., *Musik und Tanz*, Archäologica Homerica 3/U (Göttingen, 1968).
- *Das Musicleben der Griechen* (Berlin, 1949).
- West, M. L., *The East Face of Helicon* (Oxford, 1997).
- "The Babylonian Musical Notation and the Hurrian Melodic Texts", *Music and Letters* 75 (1993/4), 161-79.
- *Ancient Greek Music* (Oxford, 1992).
- "Analecta Musica," *Zeitschrift für Papyrologie und Epigraphik* 92 (1992a), 1-54.
- "The Rise of Greek Epic", *The Journal of Hellenic Studies* 108 (1988), 151-172.
- *Greek Metre* (Oxford, 1982).
- "The Singing of Homer", *Journal of Hellenic Studies* 101 (1981), 113-129.
- "Indo-European Metre", *Glotta* li (1973).
- "Greek Poetry 2000-700 B.C.", *The Classical Quarterly* n.s. 23 (1973b), 179-192.
- "Stesichorus", *The Classical Quarterly* n.s. 21 (1971), 302-314.
- "The Eighth Homeric Hymn and Proclus", *The Classical Quarterly* n.s. 20 (1970), 300-4.
- Widdess, R., *The Ragas of Early Indian Music* (Oxford, 1995).
- Wilamowitz-Möllendorff, U. von., *Timotheus: Die Perser* (Leipzig, 1903).
- Winkler, J. J., "The Ephebes' Song: *Tragoidia* and *Polis*" in Winkler/F. I. Zeitlin (ed.), *Nothing to do with Dionysus?* (Princeton, 1989), 20-62.
- Winnington-Ingram, R. P., *Mode in Ancient Greek Music* (Cambridge, 1936).

- “Aristoxenus and the intervals of Greek music”, *Classical Quarterly* 26 (1932), 195-208.
- “The Spondeian Scale”, *Classical Quarterly* 22 (1928), 83-91.
- Wiora, W., “Older than pentatony”, in Rajeczky, B./Vargyas, L. (ed.), *Studia memoriae Belae Bartók sacra* (Budapest, 1959), 183-206.
- Woodard, R. G., *Greek Writing from Knossos to Homer: A Linguistic Interpretation of the Origin of the Greek Alphabet and the Continuity of Ancient Greek Literacy* (Oxford, 1997).
- Wright, J., *Comparative Grammar of the Greek Language* (Oxford, 1912)
- Wulstan, D., “The Earliest Musical Notation”, *Music and Letters* 52 (1971), 365-382.
- “The Tuning of the Babylonian Harp”, *Iraq* 30 (1968), 215-228.
- Younger, J. G., *Music in the Aegean Bronze Age* (Jonsered, 1998).